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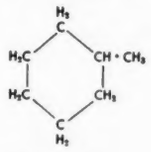
CHEMICAL INDUSTRIES

The Chemical Business Magazine

METHYL CYCLOHEXANE, TECHNICAL



Properties:

Colorless liquid with a characteristic odor.

Boiling Range, 5-95%	100-103° C.
Freezing Point	<—120° C.
Specific Gravity at 25/25° C.	0.768
Flash Point	—5° C.
Fire Point	—5° C.
Refractive Index at 25° C.	1.421

Solubility:

at 25° C. in g./100 g. of solvent

Acetone	∞
Benzene	∞
Carbon Tetrachloride	∞
Ether	∞
Methanol	53
Water	Insoluble

DOW SPECIAL PRODUCTS— NEW DOORS TO PRODUCT DEVELOPMENT

BUSINESS records reveal that many Dow *Special Products* of the past have opened new doors to chemical advancement. This is Dow's constant objective—and it is with this purpose in mind that another Special Product is offered today.

In METHYL CYCLOHEXANE, Technical, manufacturers and industrial chemists will find new stimulus for continued research and product development. Though only limited quantities are available under present conditions, all inquiries will receive prompt attention. And, as important applications develop, every effort will be made to increase production.

DOW

THE DOW CHEMICAL COMPANY, MIDLAND, MICH.
New York, St. Louis, Chicago, San Francisco, Los Angeles, Seattle, Houston

DOW *Special* PRODUCTS NEW CHEMICALS FOR THE NATION'S DEVELOPMENT

This Is NO TIME To Be a Squirrel!

Squirrels, you know, are always hiding away more food in the ground than they can possibly use. . . . But for some reason, there always seems to be enough food around to save them the trouble of digging most of it up.

Probably some companies, unintentionally of course, are playing "squirrel" . . . by tucking away supplies of alkalies "just in case something happens. . . ."

This is an excellent way to help make that "something" happen *right here at home!* If you build up alkali inventories beyond normal requirements, you are taxing production facilities, and preventing delivery of vitally important basic war materials that are urgently needed *now* for the production of ammunition, guns, airplanes, clothing and hundreds of other war necessities.

There is actually no necessity for "stocking up" on alkalies. The raw materials for making alkalies are abundant in America. There are many giant plants now manufacturing tremendous quantities of the finished product. Obviously, war needs come first, which may necessitate sacrifices on the part of companies not producing war materials. In general, however, there are enough alkalies to go around *if none of us plays squirrel.*

FOR VICTORY

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SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

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Long used and proven method of protecting wood from attack by termites and rot fungi is the ZMA Process—developed by our affiliated company, the Curtin-Howe Corporation.

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Wood preserving is but one of many fields in which Westvaco Chemicals have helped to produce better results at lower costs.

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Division of WESTVACO CHLORINE PRODUCTS CORPORATION

CHRYSLER BUILDING, NEW YORK, N. Y.

CHICAGO, ILL. · GREENVILLE, S. C. · NEWARK, CAL.

The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Volume 50 — Number 4

APRIL, 1942

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In the laboratory, in the plant and in the field, Mathieson chemists and engineers have been leaders in research and in the development of new products . . . in the adaptation of both new and old products to more efficient use in industry . . . in the modern transportation and low-cost distribution of chemicals direct to the consumer.

Today, the towering stacks of three great Mathieson plants are dynamic evidence of a half century of progress in the production and distribution of quality chemicals. Strategically located at Saltville, Va., Niagara Falls, N.Y., and Lake Charles, La., these three manufacturing units are in a position to serve consumers of alkali and chlorine products throughout the chief industrial areas of the country.

In 1942, on its 50th Anniversary, The Mathieson Alkali Works is proud to rededicate its plants and personnel to a nation at war . . . confident that the vision and initiative which have made America strong will win through to victory.

MATHIESON CHEMICALS

CELEBRATING FIFTY YEARS OF SERVICE TO AMERICAN INDUSTRY AND PUBLIC HEALTH

THE MATHIESON ALKALI WORKS (INC.), 60 E. 42ND STREET, NEW YORK, N. Y.

THE READER WRITES

The Little Fellow and Conversion

Realizing that the Government is doing a good job in organizing for war and that it is more important to get the big producers started than to worry about what will happen to the small plants engaged in making consumer goods, we have been accepting philosophically, the shunting of what we wanted to get, into war goods.

We could see that the major requirements were for machining hard goods, metals, tools and the like for which we are not equipped. Therefore, we pulled to the side of the road to allow the fire engines to get to the fire.

As your letter to Mr. Kenneth Tator states, if people like ourselves could find out what we could do—not to get business—but to make what would help to kill a Jap, we, and there are thousands like us, could do some work.

Mr. Thompson, whose letter you published states: "If plants having available equipment would list them with this section and also indicate to what use they might be put, it would be very helpful in speeding up plant conversion to war needs." That is only a partial answer to the problem. It is only a partial method of harnessing the potential value of the thousands of small plants that don't know what to do.

To put it concretely, the canning process was invented because Napoleon announced he wanted a method for preserving food. Kettering invented the self-starter because the self-starter was wanted.

We small manufacturers want to know what is needed, also.

In peace time, a great many small plants come into existence because some man figures out a metal polish or a window cleaner or a hairpin, not because someone asks him what equipment he has and then tells him what to make with it, but because he gets an idea and gambles that the public will buy what he can make.

In peace time, the various arsenals carry on experiments which are not published, although there is some collaboration with industry. Occasionally they let an educational contract. There is some private experimentation in munitions, armor plate and the like, but to the general public, munitions and war supplies are closed books.

Therefore, it is not for the public to say we can make this or that, but for the Government to say we want so and so today; this and this tomorrow and even to outline needs for things that do not exist. The small plants can then go to work.

The larger organizations can send men to Washington, to various Government purchasing and planning agencies, to arsenals, to the Quartermaster Corps, to various Army depots, Navy Yards, etc., and get this information direct and sift out what they can do. The larger organizations are called in by the Government agencies and told what to get started on.

We little fellows may be able to do more than just sit around if we are given an idea of what is needed. I hope that you will try to develop this as a department in CHEMICAL INDUSTRIES.

Editorial Note: The identity of this subscriber is withheld but he is the president of a small but important concern. Possibly the answer to his problem is a trip to Washington (and we can say from many angles it will not be particularly pleasant). The men at WPB are facing a herculean task and there is small wonder that a certain amount of chaos exists. The wonder is that there is not a lot more. From personal observance we can assure this reader and others who like him are confused and in a quandary as to how they may do their "Bit" that they will get greater attention now than was possible a few months ago.

CALENDAR OF EVENTS

April 14-17, American Management Association, Packaging Conference, Astor Hotel, New York, N. Y.

Apr. 15-17, National Wholesale Druggists' Association, Mid-Year Meeting, Palmer House, Chicago, Ill.

Apr. 15-18, The Electrchemical Society, Inc., Electric Furnace & Corrosion Convention, Nashville, Tenn.

Apr. 15-17, American Water Works Association, Canadian Section, Niagara Falls, Ontario, Canada.

Apr. 16, New England Paint & Varnish Production Club, Regular Meeting, Hotel Vendome, Boston, Mass.

Apr. 16-17, National Petroleum Association, Cleveland, Ohio.

Apr. 17, American Institute of Chemists, New York Chapter, Chemists' Club, New York, N. Y.

Apr. 18, American Association of Textile Chemists and Colorists, Research Committee and Council Meetings, North Carolina State College, Raleigh, N. C.

Apr. 18, American Association of Textile Chemists and Colorists Meeting, Mid-West Section, Schroeder Hotel, Milwaukee, Wis.

Apr. 18, American Association of Textile Chemists and Colorists Meeting, Piedmont Section, Sir Walter Hotel, Raleigh, N. C.

Wk. of Apr. 19, The American Ceramic Society, 44th Annual Meeting, Cincinnati, O.

Apr. 19-23, American Society of Civil Engineers Spring Meeting, Hotel Roanoke, Roanoke, Va.

Apr. 20, Utah Paint, Varnish & Lacquer Ass'n, Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

Apr. 20-22, American Water Works Assoc., Southeastern Section, Savannah, Ga.

Apr. 20-24, American Chemical Society Semi-Annual Meeting, Memphis, Tenn.

Apr. 20-22, American Water Works Association, Southeastern Section, Savannah, Ga.

Apr. 20-22, National Sanitary Supply Assoc. Annual Convention, Morrison Hotel, Chicago, Ill.

Apr. 27, Association of Consulting Chemists & Chemical Engineers Inc. Council Meeting, The Chemists' Club, New York, N. Y.

Apr. 27-30, Chamber of Commerce of the United States, (Thirtieth Annual Meeting) Washington, D. C.

Apr. 27-30, Knitting Arts Exhibition, National Association of Hosiery Manufacturers and Underwear Institute, The Auditorium, Atlantic City, N. J.

Apr. 28, American Institute of Chemists, Pennsylvania Chapter, Houston Hall, Philadelphia, Penna.

Apr. 30, Chicago Drug & Chemical Assn. Monthly Luncheon, Club Lounge, Palmer House, Chicago, Ill.

Apr. 30-May 1, American Oil Chemists' Society, Annual Meeting, Houston, Tex.

Apr. 30-May 1, American Water Works Assoc., New York Section, Hotel Niagara, Niagara Falls, N. Y.

May 1942 American Spice Trade Association, Inc., Annual Meeting.

May 4-6, American Gas Association Natural Gas Convention, New Orleans, La.

May 4-7, American Drug Manufacturers Association, Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.

May 5-7, American Gas Association, (Distribution Conference) New Orleans, La.

May 6, American Institute of Consulting Engineers, Engineers' Club, New York, N. Y.

May 7, Indianapolis Paint, Varnish & Lacquer Assoc., Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

May 7-8, Tanners' Council of America, Spring Meeting, Waldorf-Astoria Hotel, New York City.

May 7-9, American Water Works, Pacific Northwest Section, Marcus Whitman Hotel, Walla Walla, Wash.

May 10-15, National Electrical Manufacturers' Association, (Spring Meeting) The Homestead, Hot Springs, Va.

May 11-13, American Gear Manufacturers' Assn., 26th Annual Meeting, Hotel Hershey, Hershey, Pa.

May 11-13, American Institute of Chemical Engineers, 34th Semi-Annual Meeting, Statler Hotel, Boston, Mass.

May 11-15, National Fire Protection Association, Hotel Haddon Hall, Atlantic City, N. J.

May 12-13, The Associated Cooperage Industries of America, Inc., Semi-Annual Convention, Jefferson Hotel, St. Louis, Mo.

May 13-14, American Management Association, Production Conference, Astor Hotel, New York. N. Y.

May 15-16, American Water Works Assoc., Ohio Section, Toledo, O.

May 18, Utah Paint, Varnish & Lacquer Ass'n, Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

May 18-20, Flavoring Extract Manufacturers' Assoc., 33rd Annual Convention, Hotel Pennsylvania, New York, N. Y.

May 18-22, American Association of Cereal Chemists, Annual Meeting, Edgewater Beach Hotel, Chicago, Ill.

May 19, Akron Section, American Institute of Chemical Engineers, Akron City Club, Akron, O.

May 21, New England Paint & Varnish Production Club, Regular Meeting, Hotel Vendome, Boston, Mass.

May 22, American Institute of Chemists, New York Chapter, Annual Meeting, Chemists' Club, New York, N. Y.

May 22, New York Section, American Ass'n of Textile Chemists and Colorists, Regular Monthly Meeting, Swiss Chalet, Rochelle Park, N. J.

May 23, Chicago Drug & Chemical Assn., Annual Spring Dinner Dance, Red Lacquer Room, Palmer House, Chicago, Ill.

May 25, Association of Consulting Chemists & Chemical Engineers Inc., Council Meeting, The Chemists' Club, New York, N. Y.

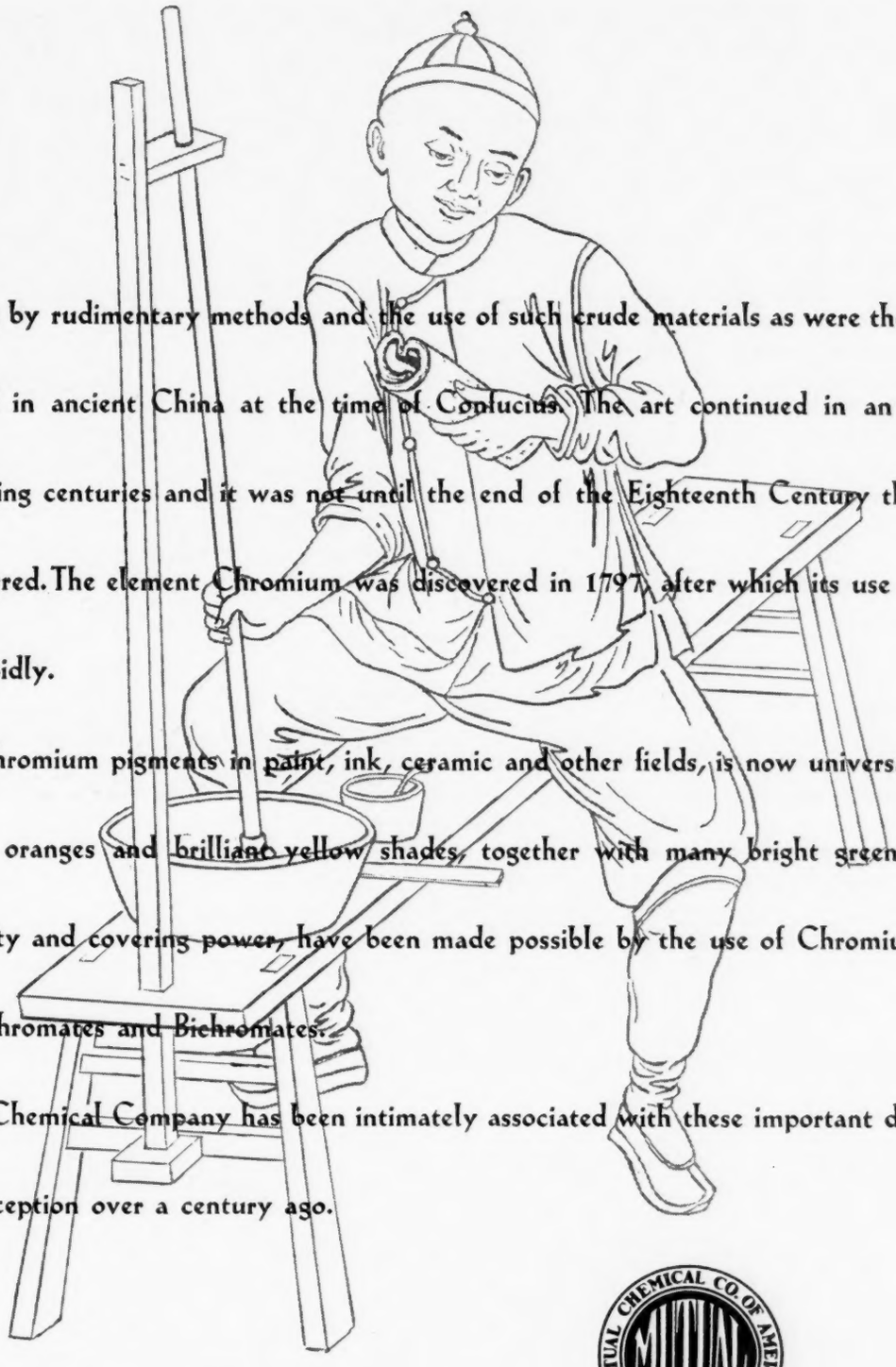
May 25-27, American Gas Association Production and Chemical Conference, New York, N. Y.

May 25-27, National Association of Purchasing Agents, 27th Annual International Convention, and Inform-a-show, The Waldorf-Astoria Hotel, New York, N. Y.

May 26-28, National Lime Association, Annual Convention, The Homestead, Hot Springs, Va.

May 27, New York Section, American Assn. of Textile Chemists and Colorists, Regular Monthly Meeting, Swiss Chalet, Rochelle Park, N. J.

May 28-29, Tanners' Council of America, Spring Meeting, White Sulphur Springs, W. Va.



Color-making by rudimentary methods and the use of such crude materials as were then available was practiced in ancient China at the time of Confucius. The art continued in an elementary state for ensuing centuries and it was not until the end of the Eighteenth Century that any real advance occurred. The element Chromium was discovered in 1797, after which its use in pigments developed rapidly.

The use of Chromium pigments in paint, ink, ceramic and other fields, is now universal. The fiery reds, mellow oranges and brilliant yellow shades, together with many bright greens possessing great durability and covering power, have been made possible by the use of Chromium pigments made from Chromates and Bichromates.

The Mutual Chemical Company has been intimately associated with these important developments since their inception over a century ago.

MUTUAL CHEMICAL CO. OF AMERICA
MUTUAL
NEW YORK, N.Y.

Mutual Chemical Co of America

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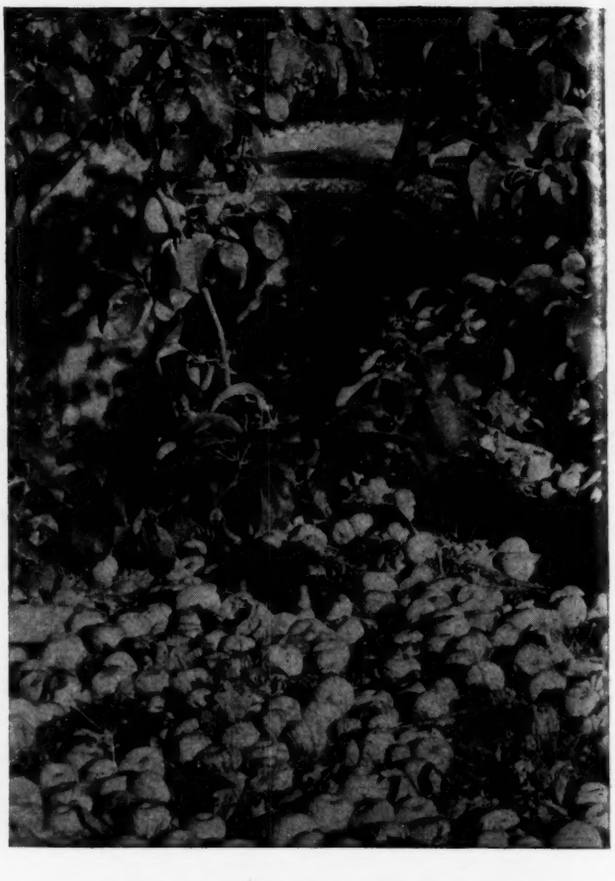
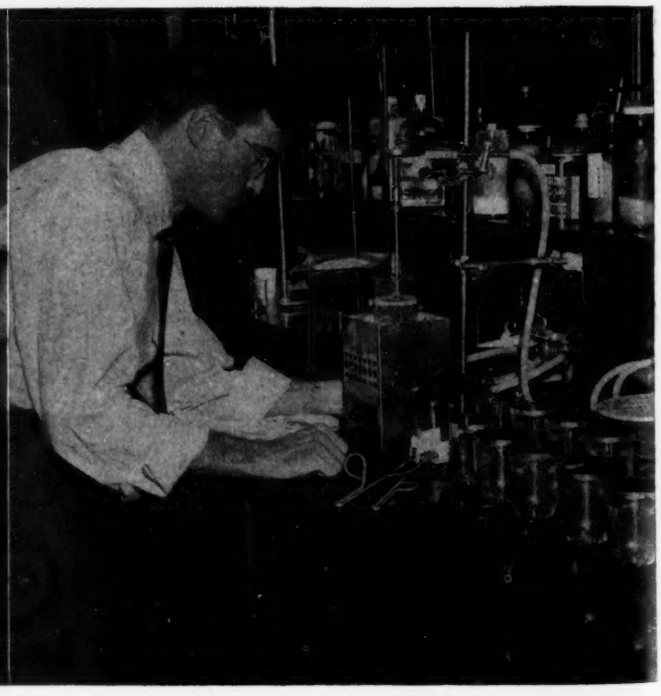
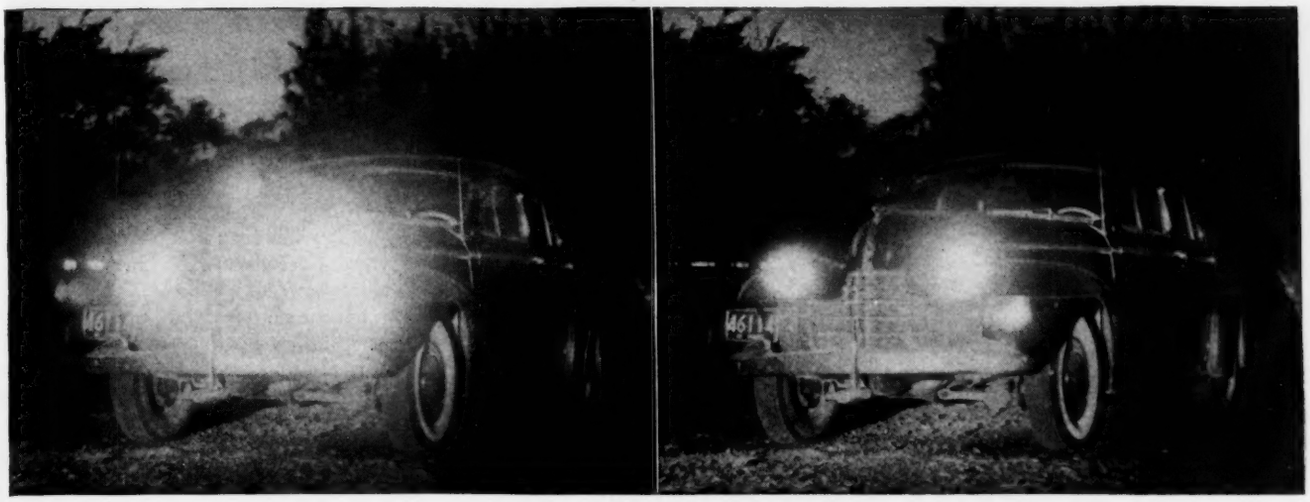
Life ON THE CHEMICAL NEWSFRONT



(*Below*) **SUGAR CONSERVATION** gets a helping hand from two new developments of chemical research. Scientists of the Department of Agriculture have devised a process for condensing apple juice into a syrup with a sugar content ranging from 65 to 70%, which may substitute for sugar in many uses. Other sugar savings are promised by the development of a new type of pectin, produced by lowering the methyl content and adding calcium salts. Present types of pectin are generally used in a 65% sugar solution in the making of jams and jellies; new type is reported effective in solutions of 50% sugar, or even less. The improved pectin is also receiving consideration as a substitute for gelatin. Photographs show (left) Dr. Roderick Eskew examining the ground apple pulp which is the starting point for the new pectin; (right) Dr. Jonathan White preparing low-sugar jellies for testing.

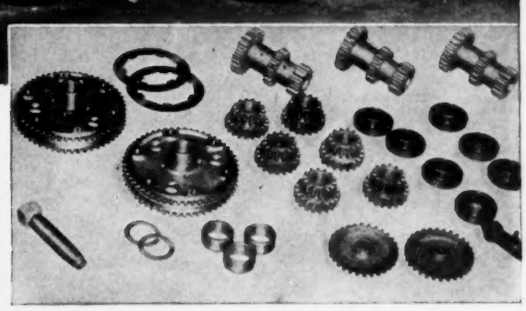
(*Above*) **CHEMISTRY SAFEGUARDS THE NATION'S CROPS,** as food supplies take on a new importance. As apples prepare to play a new role in supplementing the country's sugar supplies, chemistry provides means for protecting the apple crop from damage caused by "windfall"—the dropping of the ripening fruit from the trees before harvesting takes place. Fallen apples usually become bruised and damaged—and bruised fruit rots easily, loses its value as food. This damage can be minimized by spraying the trees with naphthalene acetic acid, now being produced by a new process developed by Cyanamid. This chemical can be used in concentrations as low as 1/1000 of 1% and is applied to the trees as harvest time approaches. Dropping of the apples is retarded by periods of ten days to two weeks.





(*Above*) **"INVISIBLE GLASS"**—glass treated to result in greatly improved light transmission characteristics—is now being produced commercially by the National Research Corporation, by the aid of high vacuum distillation of magnesium fluoride. Effectiveness of the new process in improving light transmission is strikingly demonstrated in these two photographs, taken under precisely similar conditions, except for camera lens used. Photo at left was taken with an untreated lens; photo at right with a lens coated by the new process. The properties of this type of glass are especially important in the manufacture of navigating instruments and other complicated devices, in which improvements in light transmission of as much as 100% have been obtained.

(*Below*) **OLD RECORDS ARE RESTORED** and preserved indefinitely by the William J. Barrow laminating process installed at the State of Maryland Hall of Records Building in Annapolis. Photo shows first step in process—immersion of paper in limewater bath which removes discoloration, loosens dust and grease. Paper is then placed in a calcium carbonate solution and dried in metal rack. Next, paper is placed between two thin sheets of cellulose acetate foil, covered in turn by sheets of purified tissue and by tracing cloth. All then enter a laminator where heat and pressure fuse them into a unit which remains dust-free and legible.



(*Above*) **RAPID CASE-HARDENING** of metal parts by means of AEROCASE* Case Hardening Compounds is helping to speed production of many types of equipment needed for America's Victory program. Ordinary commercial types of furnaces, such as those shown in the main photograph, are employed in the case-hardening process. Advantages of AEROCASE are its flexibility and economy of operation, and the fluidity of the bath, which lowers drag-out losses. Inset shows a variety of typical case-hardened parts.

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

*Reg. U. S. Pat. Off.

WASHINGTON

By T. N. Sandifer

FEW among the public have given much thought to the fact, but this is a political campaign year, while at the same time, in the opinion of many, it is the critical year of the war.

From a strictly selfish standpoint, the realization of the fact on the part of the Administration in power is worth considering for a moment. Time is desperately short, politically, for weighing the problems on which without a doubt, much will hinge in the Fall elections. Yet, one wrong guess about the war is all that is needed to perhaps tilt the matter one way or another.

T. N. Sandifer

The Administration must weigh now, where it will order America's initial major war effort to be made—the South Pacific, against Japan; in Europe, perhaps opening a new front against Germany; in the Middle East; or as a compromise, an attempt to scatter the military and naval resources of the country somewhere among these.

To understand the time element involved in any such decision recall the recent despatch of American forces to Australia. Their arrival was announced in March, but it can safely be assumed that this expedition was being assembled in January, perhaps little more than a month after the December Japanese attack.

The Administration must decide where the throw is to be made, then assemble the forces, with all available equipment, in the area decided upon. It takes time to assemble the troop transports at perhaps several embarkation points; it takes time to get the troops at those jump-off points, to assemble mechanical equipment, air material, and other components, get them properly distributed among the convoys, and the latter routed. It takes time to haul off the necessary naval surface craft for protecting the convoys en route, and finally time to cover the ocean areas to the destination.

The public has manifested impatience with the handling of some of these details to date, and its restiveness is no secret in Washington. It will not tolerate inaction. So, a move must be made, and it must be convincingly the right one, between now and the Fall elections.

This is not to say there will be any abrupt turnover, but in the opinion of some forecasters, it is entirely possible for changes to be made within party ranks, on both sides, to get the men in office that the public feels would help get on with the war. And, assuming some outstanding event took place in the war, it could affect the election outcomes more drastically still.

Meanwhile, the money must be found, and the materials provided, for war on a scale not imagined before. At this writing the sales tax idea is taking strong hold in some factions in Congress, but is still bitterly opposed among Administration spokesmen. There are signs that the public is veering around to economy-minded members of both House and Senate, and this question may become more prominent in coming weeks.

On the side of production of material, and providing the basic raw components in various fields much activity is evident. There is under way a study by the Health Supplies Branch of the War Production Board of the necessary steps involved in a transfer of the health supplies industry to operate under the Production Requirements Plan, which will be mentioned in its general details further on, as it affects all phases of industry. Briefly this study is being made incident to a broad new policy to bring all firms now operating under "P" orders, under the Production Requirements Plan.

Until the change is effected, so far as the health supplies industry is concerned, it will continue to operate under P-29 and should not apply under the Production Requirements Plan until general notification to do so is sent to the industry.

With this month under this policy, another long step toward gearing the whole American economy into the war program will be launched by War Production Board, with the gradual replacement beginning April 1, of general or blanket priority rating orders in favor of the Production Requirements Plan. Between now and June 30, it is known, most all of the blanket rating orders will either be revoked or allowed to expire. Companies which have been operating under such ratings will thus be compelled to apply for priority aid under the Production Requirements Plan, thus marking another fundamental change in the operation of the war-time priority system.

Under this plan a company makes a single application for priority assistance covering all of its estimated materials needs for three months' time. Priorities are then assigned on the basis of such applications, which call for much detailed information on the plant's operations. A modified version of the plan has been adopted for firms with annual business of under $100,000, for which a simplified application form, PD-25X has been drafted.

Because it would be physically impossible for the Washington machinery to cope with such a change on a given date the three-months' change-over period was decided on. Each industry will be advised through appropriate channels as to the dates at which it should complete the transition from one system to the other.

When the change has been made priority aid will be measured by specified requirements, and the War Production Board feels that it will be in position to resort to as complete allocation of materials as may be necessary according to war developments. The broad effect will be to give WPB much tighter rein on distribution and use of all scarce materials.

Recent WPB action includes the following:

Issued General Preference Order M-60 under which use of cocoanut oil, babassu oil, palm kernel oil and other oils with high lauric acid content is restricted. During April and May such restriction will allow customary use up to 50 per cent of average monthly use in 1941. After June 1, restrictions become fully effective. Copies of Form PD-354, on which inventories above certain levels must be reported were to be ready shortly after the first of April.

Removed restrictions on sale of tung oil by Amendment No. 2 to General Preference Order M-57, under which manufacturers holding stocks they cannot themselves use, may sell to other producers for specified uses.

Issued Order M-18-b placing limitations on use of chromium in chemicals, including soap; restricting manufacture

(*Continued on page 444*)

HIGH ABOVE the tall-masted clipper ships . . . the scurrying ferries . . . and bustling harbor traffic, one of the wonders of the world was reared to span the East River and join Manhattan Island with Brooklyn Heights. Uniting as it did two important parts of the great and growing port of New York, succeeding generations have witnessed the immeasurable service rendered by the Brooklyn Bridge.

LANDMARK OF ACHIEVEMENT

NEW YORK AND BROOKLYN SUSPENSION BRIDGE, DRAWN BY CHARLES GRAHAM, REPRODUCED THROUGH COOPERATION OF THE BROOKLYN EAGLE.

The Niagara Alkali Company and the Electro Bleaching Gas Company have now embarked upon a similar union of resources and facilities to broaden and advance, by consolidating into one great enterprise, their essential services in the field of chemical supply. The quality reputation of all products . . . the fine traditions of management . . . will be maintained as heretofore, to distinguish this greater American business.

Niagara
ALKALI COMPANY
60 EAST 42nd STREET, NEW YORK, N. Y.

CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH
Liquid Chlorine

EBG NIAGARA ALKALI COMPANY

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

Senate Opens Patent Inquiry

Senate Patents Committee has subpoenaed records of the Department of Justice and a score of leading industrial firms preliminary to a study of the effect of patent controls on war production. Following war materials are under scrutiny: magnesium, hormones, film, paraffin, methane steam process products, dye stuffs, iron carbonyl, ammunition, zinc cellophane, soap, plastics, tungsten carbide, colombium and other steel alloys, military optical goods, acetylene, aceticacid, electrical equipment, and related products in the electronic field, rayon, aviation gasoline pumps, Diesel engines, aircraft instruments and accessories, beryllium, synthetic quinine, tin, alcohol and synthetic rubber.

PRICES:—Quotations on lead acetate have been advanced 75 cents per cwt. Zinc oxide dealers and exporters are meeting in New York April 17 with Price Administration officials to discuss dealer and export margins and small sales. (Producers are currently operating under a voluntary price agreement.)

PERSONNEL:—DeWitt Thompson, assistant salesmanager for Mathieson Alkali, has been commissioned a lieutenant in the U. S. Naval Reserve Aviation Section. He reports for active duty at Quonsett, R. I., April 15. He was feted at a luncheon at the Chemists' Club, Tuesday, April 14. Walter M. Fenton, formerly with Baker & Adamson Division of General Chemical, is now with S. B. Penick & Co. M. R. Bhagwat, former secretary of the Chemists Advisory Council, is now with Mathieson Alkali in the Niagara Falls plant. C. W. Dermitt has joined the heavy chemical sales division of the Pennsylvania Salt Manufacturing Co. in the Pittsburgh office. He was formerly in the Pittsburgh territory of the Pennzoil Co. Dr. Paul Martens has retired as manager of the Metal & Thermit Corp. plant at Carteret, N. J., after having completed 33 years of active service.

FERTILIZERS:—Fertilizer sales in March were 22% under the same month in 1941. Volume of sales in the first quarter, however, was 24% above a year ago.

GOLF TOURNAMENT:—Chemists' Club of New York will hold its first golf outing of the season at Bonnie Briar Country Club, Westchester, May 21.

HELP WANTED:—U. S. Civil Service Commission is seeking junior chemists for research, investigative and other work in some branch of chemistry. Pay is $2,000 a year, no written exam required, no age limits. Further information may be had at your local post office.

GOOD WORK:—Victor Chemical employees received a telegram last month from Gen. William N. Porter, Chief of the Chemical Warfare Service. It read: "The Army commends you men and women of the Victor Chemical Works for your prompt and entirely satisfactory delivery of white phosphorus. You who made this delivery possible can feel proud of your part in providing fighting weapons for the men at the fighting front."

ALLOCATION:—About 36 chemicals or related materials have been placed under allocation by the WPB for export to Latin-America and Canada in the second quarter of this year.

SOCMA TO SEAVIEW:—Synthetic Organic Chemical Manufacturers Association will hold its annual meeting and outing June 5 and 6 at the Seaview Country Club, Absecon, N. J. Short business meeting is scheduled for Friday; golf tournament for Saturday. Manufacturing Chemists Association meeting of June 4 at the Hotel Waldorf-Astoria, N. Y. City. General Chemical's movie "Combat" will be shown at the meeting.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

MAGNESIUM:—Leo T. Crowley, Alien Property Custodian, has taken over control of the holdings of foreign nationals in the Magnesium Development Corp., N. Y., which holds valuable patents covering the manufacture of magnesium. Vested holdings of this company's stock used to belong to I. G. Farbenindustrie. Basic Magnesium, Inc., has denied charges made by Senator Bunker that it stands to make a profit of 4,280% on its Nevada refinery.

CONSTRUCTION:—Pennsylvania Salt Manufacturing Co. has announced arrangement of a contract with the Government for the construction and operation of a new plant in the Philadelphia area for the manufacture of materials used in war goods production. Construction will begin immediately and the plant is expected to be in operation within six months. New plant will fill a vital need in many fields of war goods production. At present, 55 per cent of company's entire output goes into the manufacture of war goods.

ESSENTIAL OIL SUBSTITUTES:—Essential oils for the drug and cosmetic trades, which were formerly imported, are now being successfully replaced by home-produced oils in many instances, Percy C. Magnus, president of the New York Board of Trade and head of Magnus, Mabee & Reynard, said early this month at the annual convention of the Affiliated Drug Stores at the Hotel Biltmore. The revision committee of the United States Pharmacopeia has agreed that these replacement oils are satisfactory to a considerable extent, it was brought out at the convention.

TO LIMIT PAINT COLORS:—The National Bureau of Standards has announced a recommendation limiting the variety of colors of oil paints, water-mixed paints, enamels, and varnishes, to be produced by any one concern. Sizes of containers for these products are also specified. The recommendation in its original form was promulgated in 1924, and has been revised from time to time. The current revision reduces the number of colors of oil paints, enamels, and varnishes, from 218 to 153, or 30 per cent; and the number of colors of water-mixed paints, from 127 to 101, or 20 per cent. With a view to conserving tin and steel, certain sizes of metal containers, among them the half-gallon can and the 30-gallon or half-drum, have been eliminated. Wooden containers of 30-gallon capacity are suggested for products formerly packed in 30-gallon steel containers.

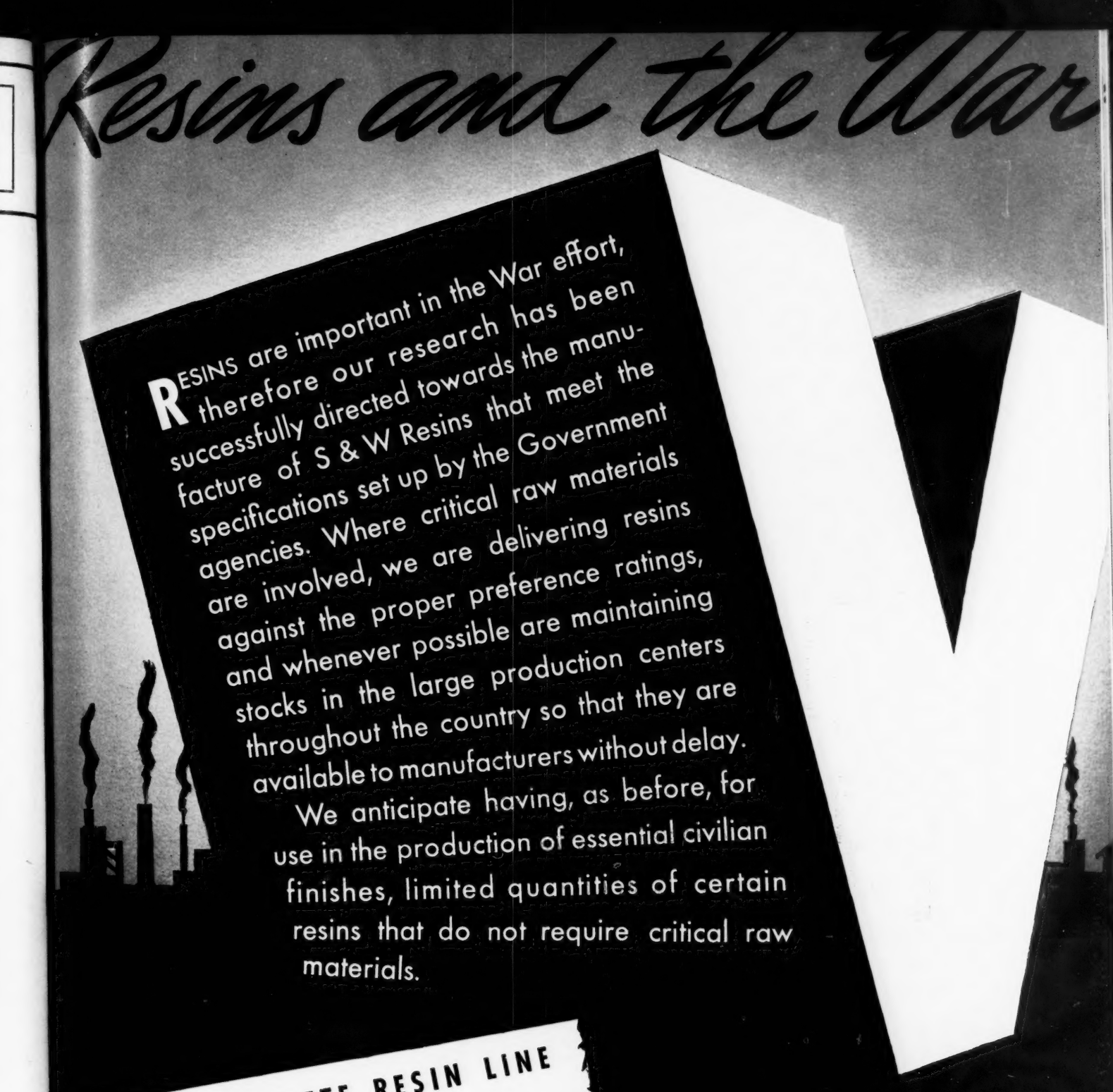
TINPLATE:—Conservation Order M-104 has been issued covering metal closures for all glass containers. This order will prohibit the use of tinplate in the manufacture of bottle tops for most uses (of particular interest to members are the following: oleic acid, alcohol, acetone, amyl acetate, triethanolamine, glycerine, polish, waxes (emulsion type), sodium silicate, benzol, turpentine) four weeks from its effective date on April 3. Certain exceptions are made to this prohibition including: C.P. acetone, C.P. amyl acetate, C.P. glycerine, C.P. carbon bisulfide, C.P. turpentine and glass containers for paste and liquid dyes for certified colors. Closures already completely manufactured on the date of the order are not affected.

MISCELLANEOUS:—Dr. Paul Dyer Merica, International Nickel V.-P., received the Franklin Institute Medal on April 15. J. G. Rosengarten, Jr., is again on the Merck board replacing his nephew, Captain Adolph G. Rosengarten, Jr., U. S. Army. Consent decrees filed in recent magnesium suits initiated by Assistant U. S. Attorney, Thurman Arnold. Willard Dow, president Dow Chemical and I. W. Wilson, Alcoa V.-P., issue statements defending their respective company's acts.

Resins and the War

RESINS are important in the War effort, therefore our research has been successfully directed towards the manufacture of S & W Resins that meet the specifications set up by the Government agencies. Where critical raw materials are involved, we are delivering resins against the proper preference ratings, and whenever possible are maintaining stocks in the large production centers throughout the country so that they are available to manufacturers without delay.

We anticipate having, as before, for use in the production of essential civilian finishes, limited quantities of certain resins that do not require critical raw materials.



THE COMPLETE RESIN LINE

"S & W" ESTER GUM—all types
"AROFENE"*—pure phenolics
"AROCHEM"*—modified types
"CONGO GUM"—raw, fused and esterified
"AROPLAZ"*—alkyds
NATURAL RESINS—all standard grades

*Registered U. S. Patent Office

All of the S & W research and production facilities are available to the trade for the many pressing problems of these times.

STROOCK & WITTENBERG CORP.

60 East 42nd Street, New York, N. Y.

PROTECTION AGAINST ROUGH HANDLING

With greater responsibility being put on shipping containers by today's high speed shipping and handling, the extra strength and durability of Bemis Waterproof Bags become more and more important. Here are containers built to stand rough handling . . . to take knocks, bumps, and the strains of stacking . . . to deliver their contents safely.

And, in addition, these Bemis shipping containers can be made to keep moisture in and dampness out—retain desirable aromas and repel objectionable odors—shut out dust and dirt—resist acids and grease.

WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

ST. LOUIS, MO. • BROOKLYN, N. Y.

WASHINGTON

(*Continued from page 442*)

chromic acid, limiting use in tanning, wood preserving, and in other chemical use, restricting to 100 per cent of base period ending June 30, 1941.

Interpreted Conservation Order M-61 to permit industrial use of finer screen Madagascar flake graphite without restriction, as conservation measure for coarser and more useful grades.

Rapeseed Distribution

Issued General Preference Order M-77 conserving supply and distribution of rapeseed oil, which will not be available in future for either edible uses or soap manufacture.

Extended General Preference Order M-52 providing for allocation of sulfite pulp to May 1.

Forecast limitation order to curtail several civilian uses of shellac.

Issued Amendment Number 6 to Order M-25, giving embalmers a higher preference rating of B-3 in obtaining formaldehyde.

Exended to May 15, General Preference Order M-41 limiting use of chlorinated hydrocarbon solvents, and extended to June 30, Preference Rating Order P-62, covering materials for production of laboratory equipment and reagent chemicals. Producers now using it probably will be required to change to Production Requirements procedure by June 30, it is stated.

Methyl Preference Rating

Issued Amendment No. 4 to General Preference Order M-31 relating to methyl alcohol, granting preference rating B-2 to shipments for use in manufacture of formaldehyde, largely industrial, and a rating of B-3 for shipments for use in plastics largely for civilian purposes. Persons requiring less than 55 gallons of methyl alcohol per month are exempted from restrictions and requirements of the Order.

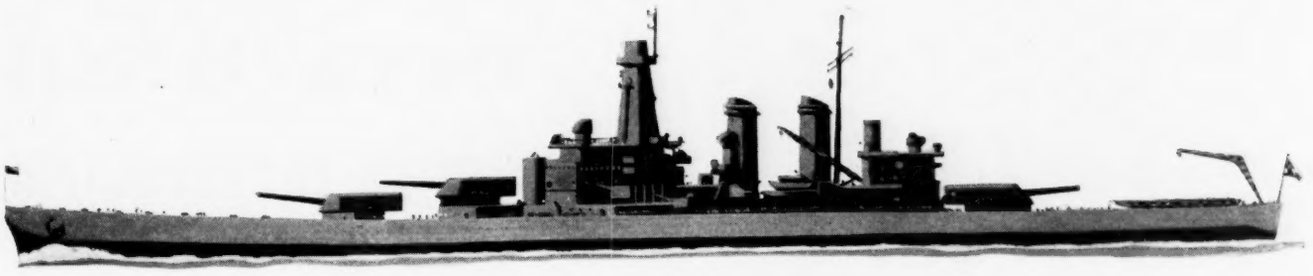
Formation of Woodpulp Allocation Industry Advisory Committee announced.

Amended M-54, molasses, to include hydrol, corn sugar molasses, in all terms of the Order, divide distributors into primary and secondary classifications, and to include all users of molasses, fix quotas for manufacturers of yeast, citric acid and vinegar, and control exports.

Issued P89, to include drums, containers, other packages and materials, under "operating supplies" for the chemical industry, also to include materials for sealing or fastening packages.

Put all deliveries of glycerine in excess of 50 pounds per month under allocation control, effective May 1, exempting deliveries for war orders and deliveries for manufacture of health supplies.

100 TONS OF PAPER PER BATTLESHIP!



CAUSTIC SODA

THE UNIVERSALLY USEFUL CHEMICAL

PAPER PLAYS a vitally important role in our national victory program. In the production of a single battleship, for example, over 100 tons of paper are needed. Blueprints, orders, communications, even actual construction work require tremendous quantities of paper. Without it, our whole industrial machine would come to a standstill.

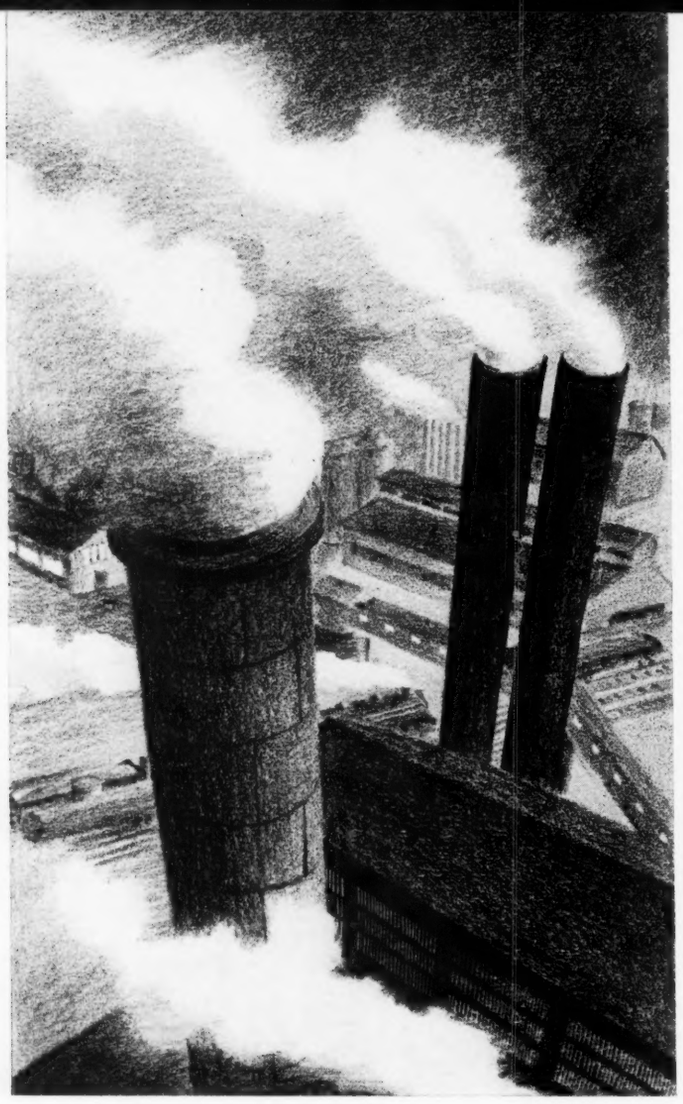
To help meet this increased demand, huge quantities of Caustic Soda are needed in paper manufacture. Through the use of this versatile chemical in the "cooking" operations, cellulose fibers of raw materials are made sufficiently pure for paper making. A better finished product results and, in many cases, basic raw materials, otherwise unsatisfactory, are made useful.

Caustic Soda is also essential in the refining of oils and fats, in the production and processing of soap and plastics and even in the reclamation of old rubber. Each of these important industries, and many others, depend on Dow Caustic Soda. They know that, in peace or war, they can rely on Dow.

DOW

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York City · St. Louis · Chicago · San Francisco · Los Angeles · Seattle · Houston



CHEMICAL PRODUCTS ESSENTIAL TO PRODUCTION

VITAL CHEMICAL MATERIALS

- Anhydrous Hydrogen Chloride
- Anhydrous Hydrogen Fluoride
- Anhydrous Boron Trifluoride
- Aluminum Salts
- Antimony Salts
- Cadmium Pigments
- Chromium Salts
- Cobalt Salts
- Manganese Salts
- Nickel Salts

Farsightedness in normal times makes us ready in an emergency . . . . Harshaw research in industrial problems during past years has developed many essential industrial chemicals needed today—it has improved quality and standardized purity, assuring industry of efficient and dependable production—and—it has developed processes for making materials that have suddenly become of vast importance in war-time production. Many materials were novelties a very few years ago—today they are key materials in refining of petroleum, making of synthetic rubber and in other industrial applications. The work done on mineral deficiencies of farm products is also important to national health and for increasing farm production.

Many of the products of peace-time imagination are today helping America toward victory.

THE HARSHAW CHEMICAL CO.

CLEVELAND, OHIO, AND PRINCIPAL CITIES

"Find out what happens when you substitute

ammonium thiocyanate"★

★ Ammonium Sulfocyanide

If you use an ammonium salt in your process you should experiment with substituting Ammonium Thiocyanate (Ammonium Sulfocyanide). Perhaps you will discover valuable modifications.

Test it in your laboratory in place of the chloride, the oxalate, the acetate, the carbonate or the nitrate.

The variations that occur from the Thiocyanate group might bring interesting and worthwhile results.

Koppers has placed in operation a large commercial plant for the production of Ammonium Thiocyanate crystals and can now offer this chemical in quantity at substantial savings over former costs. Koppers can supply Ammonium Thiocyanate crystals with a minimum purity of 95%.

Test samples, quotations and further information on request.

KOPPERS COMPANY

TAR AND CHEMICAL DIVISION

PITTSBURGH, PENNSYLVANIA

CHECK *These Chemical uses of* NUCHAR ACTIVE CARBON

In the treatment of many chemicals and pharmaceuticals, the use of NUCHAR Active Carbon has made the products more marketable and lowered the manufacturing costs. This use of NUCHAR has extended to all branches of the Chemical Industry as indicated by the following examples: inorganics such as Ammonium Chloride; alkaloids such as Quinine, Caffeine; medicinals such as Salicylates; specifics such as Arsphenamine; photographics such as Hydroquinone; plasticizers such as Tricresyl Phosphate; dye intermediates such as Sulfanilic Acid.

Chemical and Pharmaceutical Products Being Treated with Nuchar Active Carbon

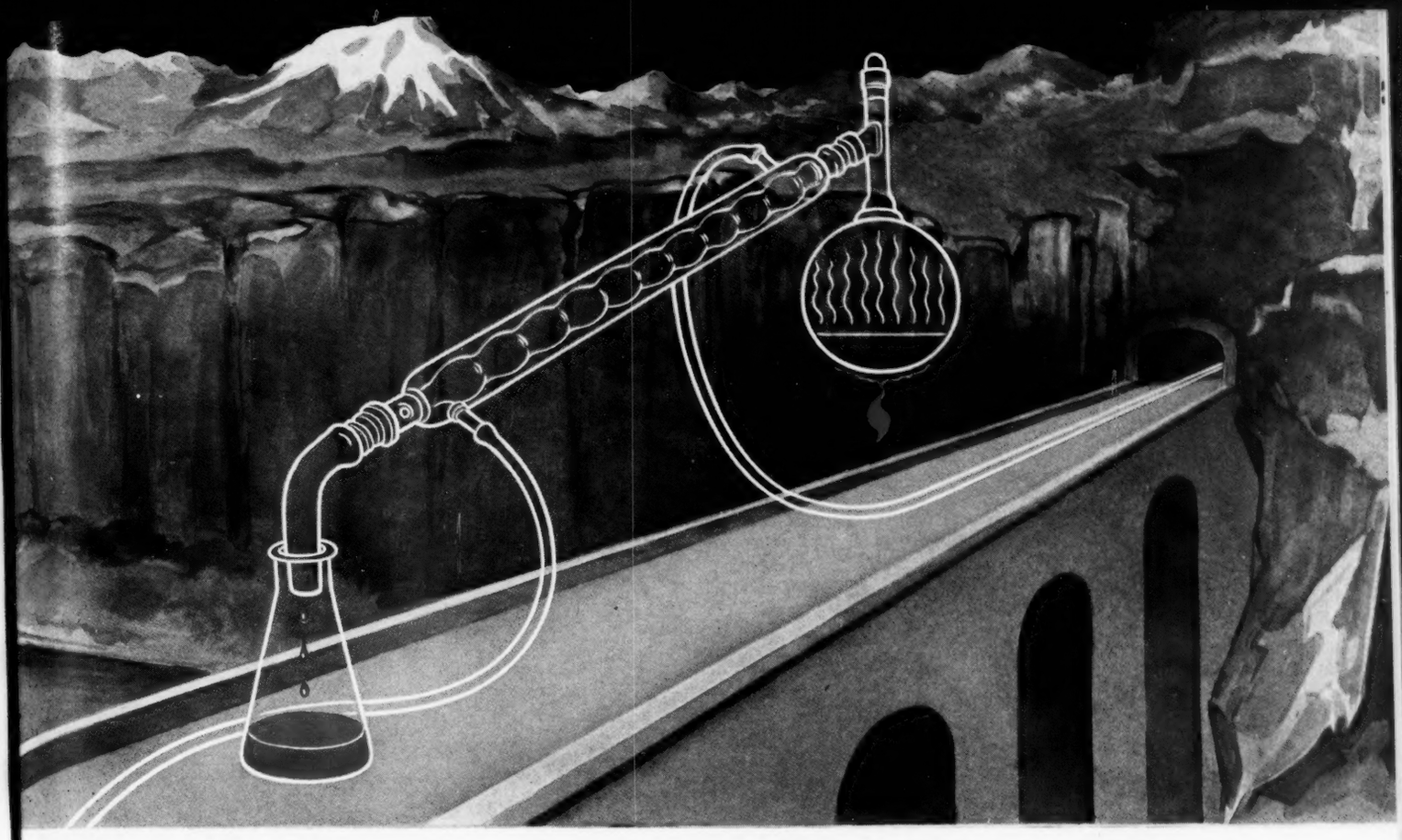
- Acid
  - Citric
  - Gallic
  - Lactic, Edible
  - Phosphoric
  - Stearic
  - Sulfuric, Reclamation of
  - Tartaric
- Alcohol, Ethyl (Neutral Spirits)
- Ammonia Liquor
- Ammonium Chloride Liquor
- Bromine
- Calcium Ferrocyanide
- Carbon Dioxide
- Carbon Tetrachloride, Reclamation of
- Coal Tar Derivatives
- Di-butoxy Ethyl Phthalate
- Drugs
  - Acetanilide
  - Alkaloids
  - Arsphenamine
  - Caffeine
  - Hydroquinone
  - Pepsin Extracts
  - Quinine Salts
  - Salicylates
  - Salicylic Acid
- Dyes
- Dye Removal
- Electroplating Solutions
- Enzymes
- Epsom Salts
- Gas
  - Nitrous Oxide
- Gasoline
- Iodine Recovery
- Kerosene
- Mono-Sodium Glutamate
- Naphtha
- Organic Liquids
  - Diethyl Phthalate
- Phosphates
- Photographic Chemicals
- Phthalates
- Phthalic Anhydride
- Potassium Ferrocyanide
- Resins, Synthetic
- Rochelle Salts
- Sodium Acetate
- Sodium Benzoate
- Sodium (Mono) Glutamate
- Solvent, Dry Cleaners
- Sulfanilic Acid
- Tri-cresyl Phosphate

NUCHAR

INDUSTRIAL CHEMICAL SALES

DIVISION WEST VIRGINIA PULP & PAPER COMPANY

230 PARK AVENUE, NEW YORK CITY
35 E. WACKER DRIVE, CHICAGO, ILLINOIS
748 PUBLIC LEDGER BLDG., PHILADELPHIA, PA.
844 LEADER BLDG., CLEVELAND, OHIO.



Tunneling through Priorities Mountain

A mighty job is being done by America's basic weapon—Chemical Research.

In the path of hundreds of manufacturers, today, stands a mountain *built* by necessity. It is Priorities Mountain, and it blocks off many raw materials.

Yet Chemical Research *tunnels through!* Chemical Research in the laboratories of thousands of manufacturers. Supplying synthetics and substitutes that are eagerly sought and bought. Bringing about new methods of manufacturing and processing. Actually *improving* products. Meeting the demands of both National Emergency and private enterprise!

* * *

In the far reaching changes that have taken place, many tonnage chemicals to exacting specifications have been required by industry. And it has been the privilege of the J. T. Baker Chemical Co. to supply some of these chemicals.

In many instances where companies required tonnage chemicals of small and exacting tolerances, the manufacturers have submitted their problems directly to us. In such cases, Baker willingly contributes the combined knowledge of its Technical, Executive and Manufacturing staffs to meet the customer's special requirements.

Baker knows the art of exactness. If you have chemical requirements of standard or special specifications, we invite you to discuss, in confidence, your needs with a Baker representative.

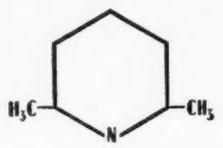
—o—

J. T. Baker Chemical Co. *Executive Offices and Plant:* Phillipsburg, N.J. *Branch Offices:* New York, Philadelphia and Chicago.

Baker's

CHEMICALS

2, 6-LUTIDINE



PURITY: Ninety-eight per cent minimum.

DISTILLATION RANGE: Ninety-five per cent shall distill within a range of 2.0°C., including the temperature of 143.8°C.

SOLUBILITY: Very soluble in water, soluble in most common organic solvents, including alcohols, ethers, esters, ketones, aliphatic and aromatic hydrocarbons.

USES: Pharmaceuticals, resins, dyestuffs, rubber accelerators and insecticides.

APPROXIMATE WEIGHT PER GALLON: 7.72-lbs.

SHIPPING CONTAINERS: 400-lb. returnable galvanized drums; 35-lb. cans.

OTHER GRADES OF 2, 6-LUTIDINE: 90% 2, 6-Lutidine.

A Dependable Source of Supply
FOR ALL COAL TAR PRODUCTS

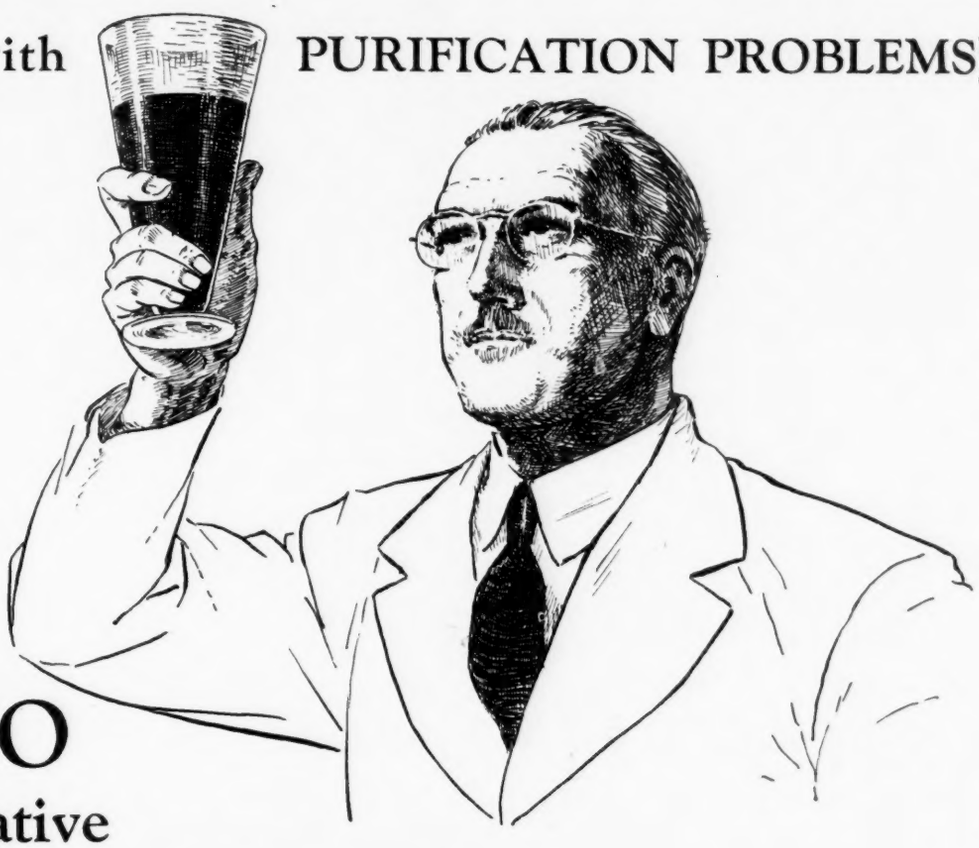
With unusual production and delivery facilities, plants in 15 strategic locations, and offices in major cities, Reilly offers a complete line of coal tar bases, acids, oils, chemicals and intermediates. Booklet describing all of these products will be mailed on request.

Reilly
COAL TAR PRODUCTS

REILLY TAR & CHEMICAL CORPORATION
Executive Offices: Merchants Bank Building, Indianapolis, Indiana
2513 S. DAMEN AVENUE, CHICAGO, ILLINOIS 500 FIFTH AVENUE, NEW YORK, N. Y. ST. LOUIS PARK, MINNEAPOLIS, MINN.
FIFTEEN · PLANTS · TO · SERVE · YOU

An activated aid to processing **DARCO** REG. U.S. PAT. OFF. *An active aid for purity specifications*

Troubled with PURIFICATION PROBLEMS?



The DARCO Representative *can help your technical staff*

If specifications on your product require freedom from color, taste, or odor, ask your technical staff to get in touch with the Darco representative.

We make this suggestion because Darco representatives are more than salesmen, in the usual sense of the word. You will find them qualified sales engineers—specialists in their field. They have a background of years of experience in purifying a wide range of products. Their knowledge of purification, plus your own familiarity with the materials to be purified, should lead directly to the results you're looking for.

In your plant, the Darco representative can give valuable suggestions on such things as maximum efficiency in mixing, contact time, counter current treatment and filtration. Each application is a problem in itself. The technically trained Darco staff is available to give the problem the attention it deserves.

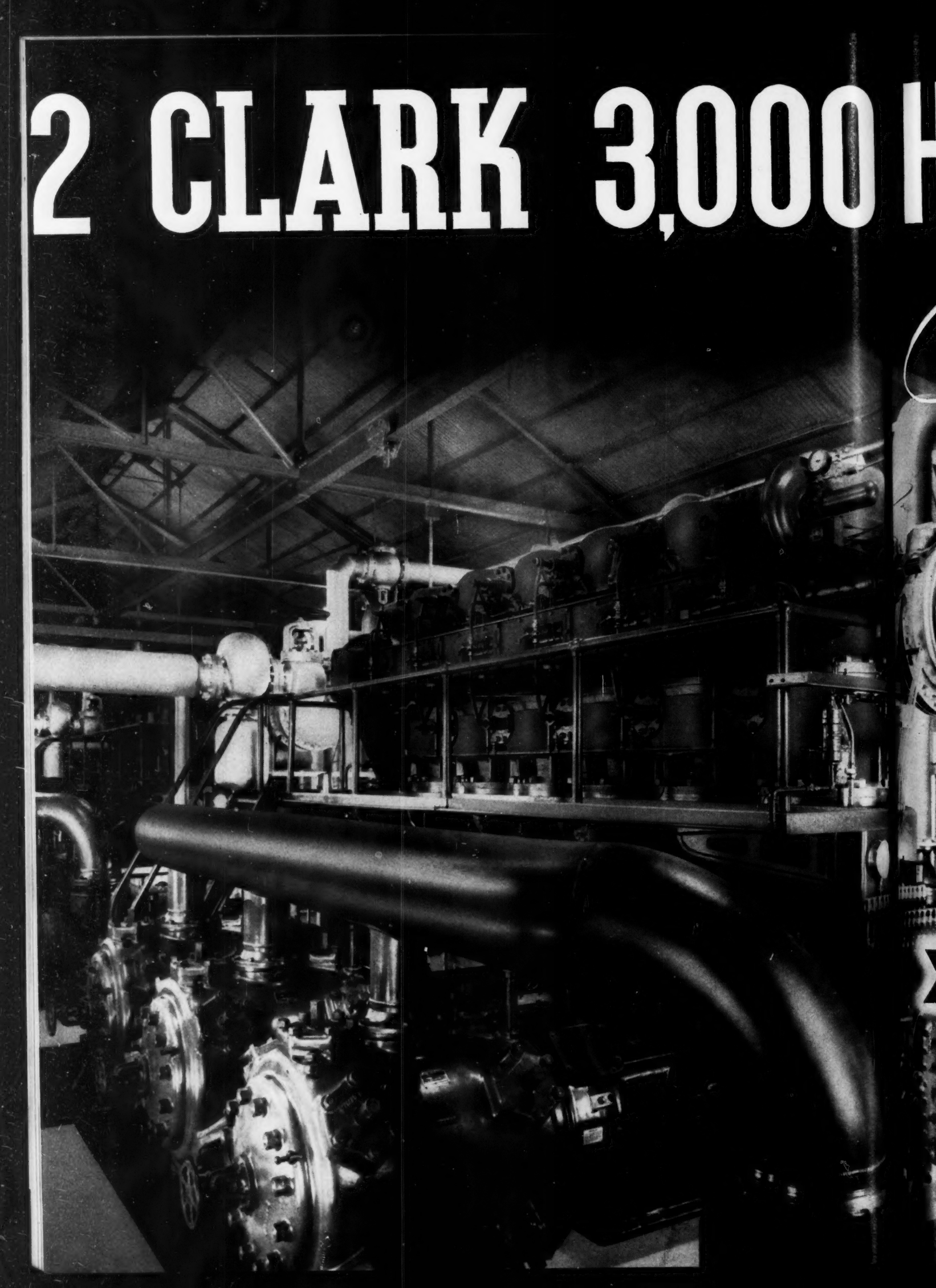
DARCO Reg. U. S. Pat. Off.

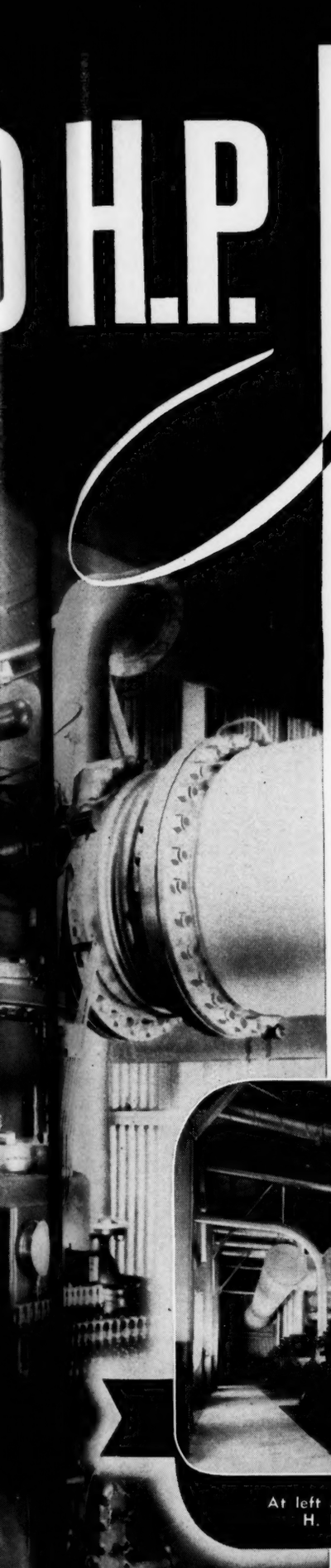
DARCO

DARCO CORPORATION

60 East 42nd Street, New York, N.Y.

2 CLARK 3,000 H





O H.P. Steam Angles

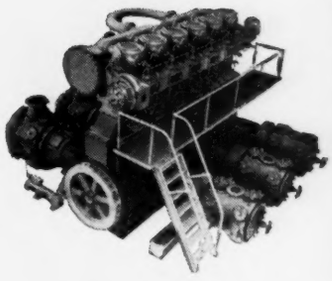
AND 3-1000 H. P. GAS-DRIVEN "ANGLES" IN THE UNION OIL COMPANY REFINERY

at Oleum, California . . . are serving in two important ways in making Hi Octane gasoline.

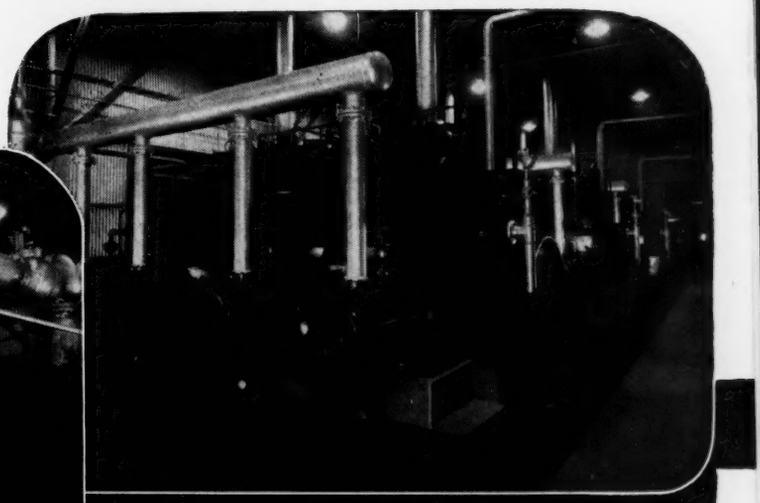
Low quality gasolines are being converted into Hi Octane gasoline by catalytic cracking. The 2 CLARK 3,000 H. P. steam-driven "Angles" furnish compressed air to burn coke, tar and asphalt from the catalyst, keeping it in efficient operation. A gas residue is then compressed by the 3 CLARK 1000 H. P. Supercharged gas-driven "Angles" to recover 8 to 15 additional gallons of highest grade gasoline per 1000 cu. ft. of residue gas.

In defense production, CLARK "Angles" are also being used for Alkylation, another new cheap method for making 100 Octane gasoline, and for producing Toluol for TNT, Artificial Rubber, Synthetic Alcohol, Synthetic Ammonia for explosives, and other important products.

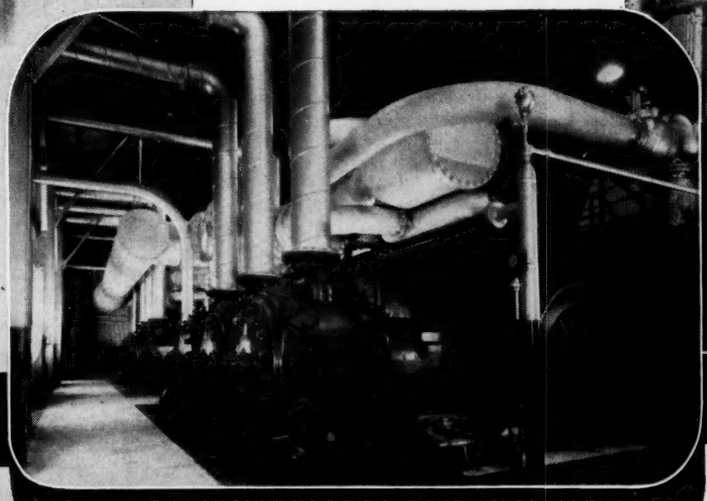
For more than 6 decades CLARK Compressors have been proving their dependability, averaging probably 98% continuous operation with few shut downs and these only after long service. Features are CLARK Super-2-Cycle Fuel Injection, no inlet or outlet valves, large bearings and few, large parts.



CLARK Steam-Driven "Angle" Compressors are offered in 3, 4, 5, 6 and 8-cylinder models ranging from 500 to 4,000 H. P. New, efficient. Ask for Bulletin 200-73.



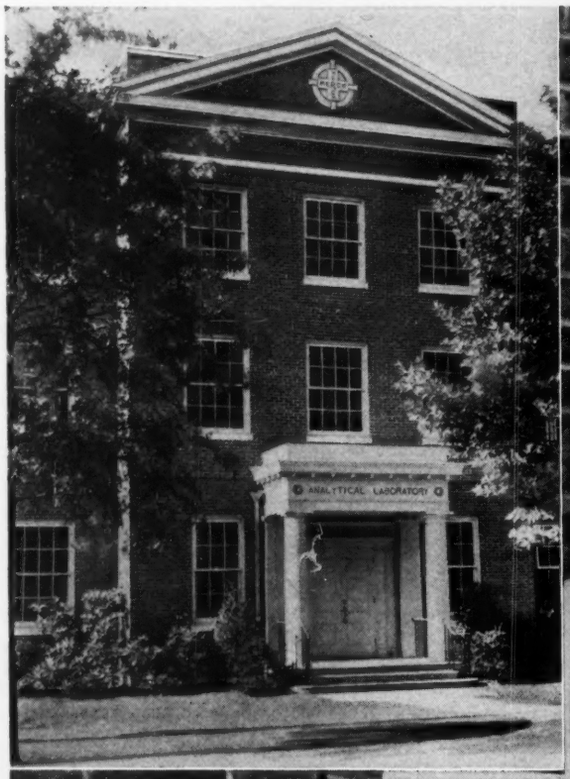
Three CLARK 1,000 H. P. Supercharged Gas-Driven "Angles", Union Refinery

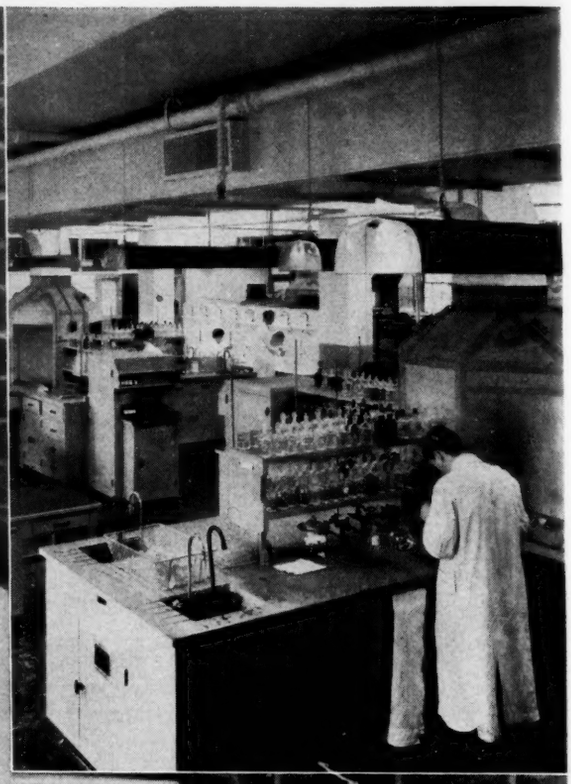


At left and above: Two views of CLARK 3,000 H. P. Steam "Angles", Union Refinery

CLARK BROS. CO., INC., Olean, N. Y. Export Offices: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Tex.; Chicago, Ill. (122 S. Michigan Av.); Boston, Mass. (131 Clarendon St.); Huntington Park, Calif. (5715 Bicket St.) Foreign Offices: 72 Turnmill St., E. C. 1, London; Avda Roque Saenz Pena 832, Buenos Aires.

CLARK





MERCK

A GUARANTY OF QUALITY

Chemical experience of many years has enabled Merck & Co. Inc. to plan, design and equip the new Merck Analytical Laboratories, wherein rigid and constant control is exercised over more than 1,500 products bearing the Merck label. The wide range of precision, analytical and testing facilities includes not only chemical methods, but physical and optical procedures as well. Because of these modern control facilities, pharmaceutical manufacturers, and those in allied professions, use Merck Chemicals with complete confidence in their purity and uniformity.

A PLEDGE OF SERVICE

Although the Merck factories are now operating on a 24-hour day, 7-day week schedule in order to supply the needs of our armed forces and civilian population, it may not always be possible to supply you immediately with your complete requirements of Merck Chemicals. But in spite of the difficulties which confront us, we shall continue to do everything possible to serve our customers to the limit of our ability. In facing the vital emergency job that lies ahead, it is our hope that we may continue to have the understanding cooperation of our customers, which has helped us immeasurably in our efforts to serve them.

For Victory—Buy United States Savings Bonds and Stamps

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York · Philadelphia · St. Louis · *In Canada:* MERCK & CO. Ltd., Montreal and Toronto

COLUMBIA CHEMICALS

We Need Your Help to Speed Industry's Greatest Task—Winning This War

You can take this for granted—we are putting everything we've got into the job of supplying Columbia Chemicals in the quantities required—at the time they are needed.

Here are some ways you can help us do this big job better: (1) Use bulk shipments instead of bags and drums. (2) Unload and release cars promptly. (3) In the interest of securing full use of available freight cars, we are loading all cars to full capacity for regular tonnage consuming customers. Let our Technical Service Department help make your unloading operations as efficient as possible in order to speed up the release of transportation equipment.

ESSENTIAL INDUSTRIAL CHEMICALS

SODA ASH • CAUSTIC SODA • SODIUM BICARBONATE • LIQUID CHLORINE • SILENE* CALCIUM CHLORIDE • SODA BRIQUETTES MODIFIED SODAS • CAUSTIC ASH • PHOSFLAKE CALCENE** • CALCIUM HYPOCHLORITE

*Precipitated Calcium Silicate **Precipitated Calcium Carbonate

COLUMBIA CHEMICALS

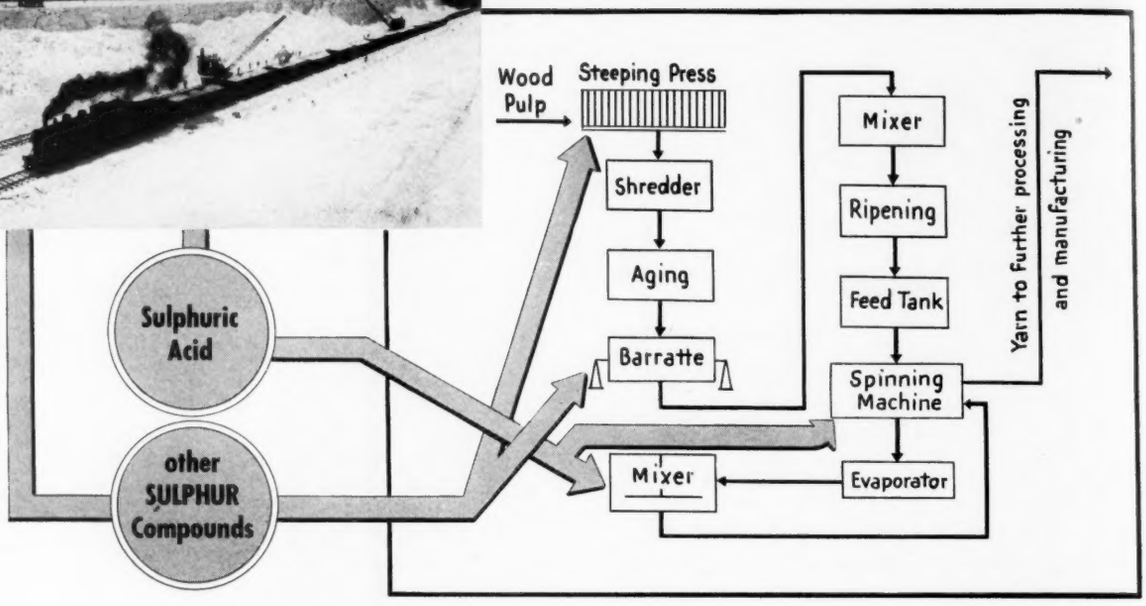
PITTSBURGH PLATE GLASS COMPANY

COLUMBIA CHEMICAL DIVISION

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • CINCINNATI CLEVELAND • MINNEAPOLIS • PHILADELPHIA • CHARLOTTE

HOW SULPHUR SERVES INDUSTRY



VISCOSE RAYON

Carbon bisulphide plus cellulose and lye forms a soluble cellulose compound which when precipitated with sulphuric acid yields rayon. Sulphonated oils aid in spinning the fibres, while other Sulphur compounds — Glauber's salt and dyes, color it.

Synthetic fibres, of ever increasing usefulness, owe a great deal to the versatility, availability, and cheapness of Sulphur. Like a cog in the wheel of industry, Sulphur and its compounds mesh with the progressive steps of processing until finally the finished product is evolved. ★ Sulphur, a vital raw material essential to American industry, is abundantly available to all consumers due to the foresight of the American Sulphur industry. ★ At the Texas Gulf mine alone there is in storage, ready for immediate shipment, sufficient Sulphur to supply the demands of the Nation for a year or more. Modern mining methods keep the rate of production well ahead of shipments.

TEXAS GULF SULPHUR COMPANY INCORPORATED

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Newgulf and Long Point, Texas

4-TG-6

No. 5 in a series of advertisements about new research chemicals.

New Synthetic Chemicals for Research Study

Four promising products for your investigation

THESE four new chemicals were synthesized in our laboratories. Their physical and chemical properties and their possible applications are outlined at the right. We invite you to investigate these new synthetic organic chemicals in your laboratory. Such investigation may lead to helpful uses in your products and processes.

Our laboratories are constantly at work, synthesizing new chemicals, discovering new and broader uses for those chemicals that have already proved their usefulness, and developing more efficient and less expensive ways of making them. These newcomers have resulted from this research program.

Although only research quantities are available now, it is possible that commercial quantities will be made in the future if important uses develop. Write for price quotations.

For information concerning the use of these chemicals, address:

Carbide and Carbon Chemicals Corporation

Unit of Union Carbide and Carbon Corporation

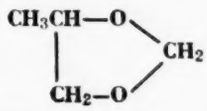
30 East 42nd Street UCC **New York, N. Y.**

Butyl "Cellosolve" Acetate

$C_4H_9OCH_2CH_2OOCCH_3$

. . . is a colorless, stable liquid with a pleasant ester-like odor. Because it possesses high solvent powers for nitrocellulose, cellulose esters, and synthetic resins, it may be used in special surface coatings, printing inks, and varnish removers. It is less water-soluble and evaporates more slowly than "Cellosolve" Acetate. Specific gravity at 20/20° C., 0.940; boiling point, 191.5°C.; refractive index, 1.4160; solubility in water at 20°C., 1.1 per cent.

4-Methyl Dioxolane



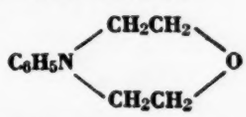
. . . is a colorless liquid useful as an extractant and solvent for oils, fats, waxes, dyestuffs, and cellulose derivatives, especially cellulose acetate. It boils at 85°C., and is 20 per cent soluble in water at 20°C. Its specific gravity is 0.988 at 20/20°C.

Methyldiethanolamine

$CH_3N(C_2H_4OH)_2$

. . . is an amine-odored, colorless liquid, miscible with water and benzene. It is suggested as an intermediate in the manufacture of textile auxiliaries, insecticides, emulsifying agents, and corrosion inhibitors. It shows some evidence of selective action in the absorption of acidic gases. Its physical properties include: specific gravity, 1.043 at 20/20°C.; refractive index, 1.4699; boiling point (at 4 mm.), 121°C.; equivalent weight, 119.

N-Phenyl Morpholine



. . . is a white solid suggested as a chemical intermediate in the manufacture of dyestuffs, rubber accelerators, corrosion inhibitors, and photographic developers. It is one per cent soluble in water at 20°C., melts at 52-56°C., and boils at 265-268°C. Its vapor pressure is less than 0.1 mm. at 20°C.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

★ America's all-out Victory Program requires ever-increasing quantities of coal-tar chemicals for which Barrett is a key source of supply—

Toluol for TNT . . . *Benzol* for Tetral ...*Phenol* for picric acid...*Anhydrous Ammonia* for nitric acid and ammonium nitrate...*Phthalic Anhydride* for di-butyl phthalate for smokeless powder —also for ship, tank and truck finishes... *Hydrogenated Products* to improve performance of lubricating oils . . . *Pyridines* for sulfa drugs . . . *Quinoline* for vitamins . . . *Tar Acids* for plastics, disinfectants and pharmaceuticals . . . *Rubber Compounding Products* for extending the vital rubber supply . . . *Cumar** for waterproofing tarpaulins, tenting and other military fabrics . . . *Naphthalene* and *Cresol* for insulating materials for military cable . . .

Because these and other chemicals are so vital to winning the war, we ask the indulgence of our customers in civilian industries if deliveries are delayed. Barrett's vast facilities and 88 years of manufacturing experience are being utilized to keep production at top limits.

★ ★ ★ ★ ★ ★ ★ ★

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK
BARRETT CHEMICALS

Tar Acids
Phenols
Cresols
Cresylic Acids
Naphthalene
Phthalic Anhydride
*Cumar (Paracoumarone-Indene Resin)
Rubber Compounding Materials
Bardol*
Barretan*
Pickling Inhibitors
Benzol
Toluol
Xylol
Solvent Naphtha
Hi-Flash Solvent
Hydrogenated Coal-tar Chemicals
Flotation Agents
Tar Distillates
Anhydrous Ammonia
Sulphate of Ammonia
Arcadian* the *American* Nitrate of Soda

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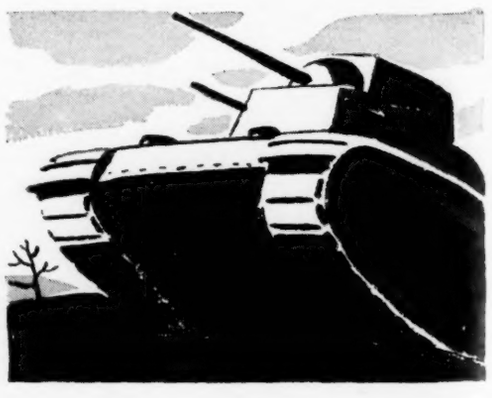

WE'RE WORKING FOR *HIM...*

BUT WE HAVEN'T FORGOTTEN *YOU!*

Because defense industries come first, it is becoming increasingly difficult for us to fill your orders. We are sure you understand and appreciate the problems we are up against.

But there is a bright side of the picture — for *you*. Now that we are working at top speed — day and night — we are quickly learning many new and better methods of manufacture and are steadily improving the quality of our products.

When Victory is won, our regular customers should most certainly benefit from the new standards of quality which our accelerated war effort will have produced.

MICHIGAN ALKALI COMPANY

FORD BUILDING, DETROIT, MICHIGAN

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GROWING

As defense demands grow, so does the capacity of

HOOKER

plants. New buildings have been added. Others are under construction. More are planned. Departments have been reorganized to accommodate increased personnel. Much new production equipment has been installed. More is to come.

The effort to take care of customers will continue unabated. So will the maintenance of every safeguard to the quality of HOOKER Chemicals. And the HOOKER technical staff is available at all times for assistance in solving problems related to the production and use of chemicals.

HOOKER

ELECTROCHEMICAL COMPANY

NEW YORK CITY — NIAGARA FALLS, N. Y. — TACOMA, WASH.

MURIATIC ACID · CHLORBENZENES · SULFURYL CHLORIDE · ANHYDROUS METAL CHLORIDES · METHYL BENZOATE
LIQUID CHLORINE · THIONYL CHLORIDE · CAUSTIC SODA · SODIUM SULFIDE · DYE INTERMEDIATES

857-D

INDUSTRIAL PRODUCTS BY FERMENTATION PROCESSES

NOAH has received credit for one of the earliest recorded chemical discoveries. He found that under some conditions grape juice underwent a change and the resulting product, when imbibed, produced a pleasant physiological effect entirely different from that which the original juice gave. Unfortunately, as a result of continuing his testing "not wisely but too well", he has received some undesirable notoriety.

It was also observed at an early date that sometimes fruit juices underwent another type of change which resulted in the development of sourness. Milk was also found to become sour on storage. Since the resulting products found practical use, empirical methods of regulating these alterations were developed.

Not until the investigation of Pasteur was it recognized that these changes were due to the growth of various microscopic organisms. It had been noticed earlier, however, that the development of visible organisms, termed molds, also resulted in changes of the medium on which they grew.

Since Pasteur a large number of experimenters have developed methods not only of preventing, but also of encouraging, the growth of these organisms, both visible and microscopic. Others have studied the chemical changes brought about by them. It is now recognized that these reactions are similar to, or in many cases the same as, those occurring during the development of a fruit or vegetable and are natural vegetative processes.

As a result of some of these researches a considerable variety of products of industrial importance is now being manufactured by the careful cultivation of a number of these organisms. Since this is a comparatively new field, it can safely be assumed that with time the number of compounds produced by such methods will be greatly enlarged. The probability of this is increased by the fact that the raw materials for such processes are generally of American agricultural origin, thus removing any dependence on foreign products.

Chas. Pfizer & Co., Inc. has been one of the leaders in this field and is at present producing Citric Acid, Gluconic Acid, Fumaric Acid, and Oxalic Acid by such methods. From these acids a wide variety of derivatives is being manufactured. A well-trained research staff is engaged in the improvement of present processes and in the development of new products. Results in many of these latter investigations indicate that products of possible importance in a variety of fields will in time be made available.

MANUFACTURING CHEMISTS · ESTABLISHED 1849

CHAS. PFIZER & CO., INC.

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CARBON BISULPHIDE

and

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WHITING

PACIFIC COAST PRODUCTS

SULPHATE OF ALUMINA : COMMERCIAL MURIATIC ACID
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Stauffer

Stauffer Chemical Co.

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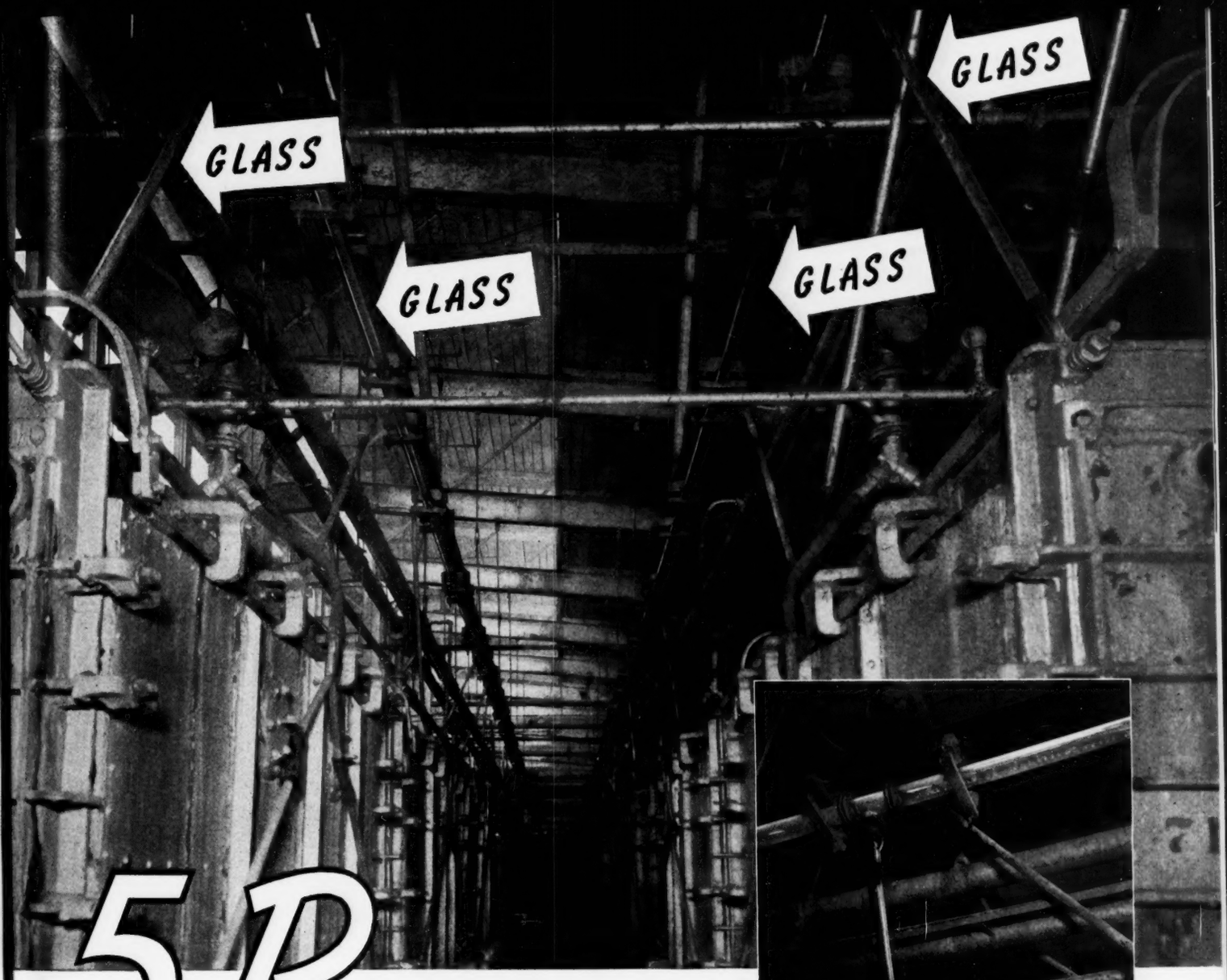

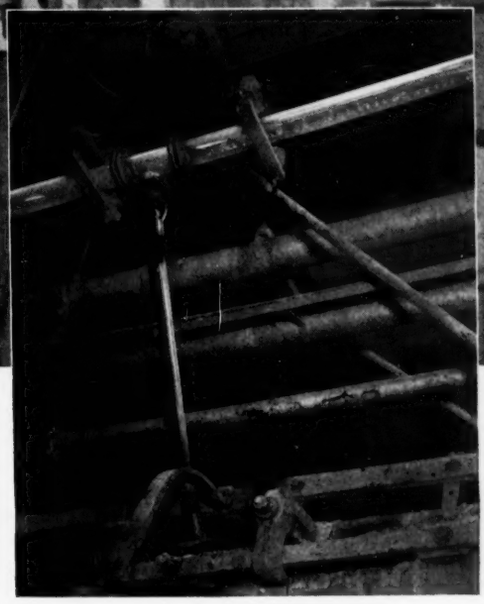

5 Reasons
WHY THIS MILL USES PYREX PIPING

If, like the West Virginia Pulp and Paper Company, you had to convey brines, sodium carbonate solution, and wet chlorine gases in a battery of electrolytic cells, what piping would you use to solve the severe corrosion problems involved?

The West Virginia Pulp and Paper Company chose PYREX Piping and used it for brine feed lines, cell over-flow lines, and lines carrying chlorine gas to the "PYREX" cooler for liquefaction.

In this particular installation the high corrosion resistance and other resistant qualities of PYREX Piping offered the following five important advantages:

1. No leaky lines
2. No fumes
3. Minimum maintenance of Cl_2 and brine lines
4. Visual evidence that all cells are getting brine
5. Purer product.

PYREX Piping may be the solution to one or more of *your* piping problems. Corning Engineers will gladly help you find out. Write to Industrial Division, Corning Glass Works, Corning, New York.

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works

CORNING
Glass Works
Corning, New York

Pyrex Industrial Glass

INDUSTRY ANSWERS THE CALL!

A WAR MESSAGE
to
ALL EMPLOYERS
★ From the United States Treasury Department ★

Whether you WAR is going to take the mightiest effort America has ever made—in men, materials, and money!

An important part of the billions of dollars required to produce the planes, tanks, ships, and guns our Army and Navy need must come from the sale of Defense Bonds. Only by regular pay-day by pay-day investment of the American people can this be done.

Facing these facts, your Government needs, urgently, your cooperation with your employees in ceaselessly enrolling them in

A PAY-ROLL SAVINGS PLAN

The voluntary Pay-Roll Savings Plan (approved by organized labor) provides for regular purchases by your employees of Defense Bonds through voluntary pay-roll allotments. All you do is hold the total funds authorized from pay-roll allotments in a separate account and deliver a Defense Bond to the employee each time his allotments accumulate to an amount sufficient to purchase a Bond.

You are under no obligation, other than your own interest in the future of your country, to install the Plan after you and your employees have given it consideration.

WHAT THE PAY-ROLL SAVINGS PLAN DOES

1. It provides immediate cash now to produce the finest, deadliest fighting equipment an Army and Navy ever needed to win. 2. It gives every American wage earner the opportunity for financial participation in National Defense. 3. By storing up wages, it will reduce the current demand for consumer goods while they are scarce, thus retarding inflation. 4. It reduces the necessity of Defense financing that must be placed with banks, thus putting our currency financing on a sounder basis. 5. It builds a reserve, buying power for the post-war purchase of civilian goods to keep our factories running after the war. 6. It helps your employees provide for their future.

To get full facts on installing the Pay-Roll Savings Plan, write TODAY to Treasury Department, Section B, 709 12th Street, NW., Washington, D. C.

U. S. Defense BONDS ★ STAMPS

This space contributed to National Defense by

YOUR NAME HERE

16—26126-1 GPO

DSS BP-2a

32,145 Firms With Over 17,700,000 Employees Have Installed the . . .

PAY-ROLL SAVINGS PLAN

Have YOU Started the Pay-Roll Savings Plan in YOUR Company?

Like a strong, healthy wind, the Pay-Roll Savings Plan is sweeping America! Already more than 32,000 firms, large and small, have adopted the Plan, with a total of over seventeen million employees—and the number is swelling hourly.

***But time is short!*. .More and more billions are needed, and needed fast, to help buy the guns, tanks, planes, and ships America's fighting forces *must* have. The best and quickest way to raise this money is by giving *every* American wage earner a chance to participate in the regular, systematic purchase of Defense Bonds. The Plan provides the one perfect means of sluicing a part of ALL America's income into the Defense Bond channel regularly every pay-day in an ever-rising flood.**

Do *your* part by installing the Pay-Roll Savings Plan *now*. For truly, in this war, this *people's* war, VICTORY BEGINS AT THE PAY WINDOW.

Plan Easy to Install

Like all efficient systems, the Pay-Roll Savings Plan is amazingly easy to install, whether your employees number three or ten thousand.

For full facts and samples of free literature, send the coupon below—today! Or write, Treasury Department, Section C, 709 Twelfth Street NW., Washington, D. C.

MAIL THIS COUPON NOW

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709–12th St., NW.
Washington, D. C.

We want to do our part. Please rush full information regarding the Pay-Roll Savings Plan.

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POSITION .....

COMPANY NAME .....

ADDRESS .....

NUMBER OF EMPLOYEES .....

TREASURY DEPARTMENT

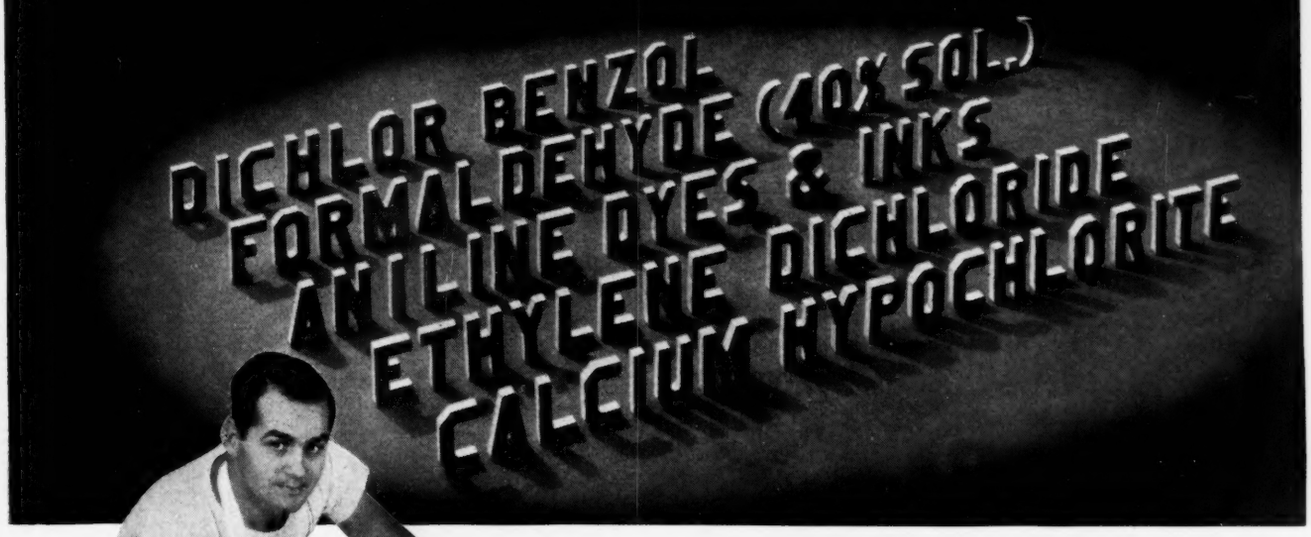
MAKE EVERY PAY-DAY . . . BOND DAY!

U. S. Defense BONDS ★ STAMPS

This space is a contribution to NATIONAL DEFENSE by (name of publication).

GPO 16—26944-1 Form No. DSS-280

STEEL CONTAINERS for active chemicals difficult to pack



Steri Seald

TRADE MARK REG. U. S. PAT. OFF.

LINED STEEL DRUMS AND PAILS

are now used for the safe shipment of these and hundreds of other chemical products that in the past have required expensive tin lined containers.

The scarcity of tin for this use has made the development of the modern Steri Seald container assume utmost importance to the chemical industry. For today the solution to your container problem may be already solved and the answer awaiting in the Wilson & Bennett research laboratory.

Specially developed lining compounds have been tested for many chemicals under actual filling and storage conditions over a period of many months until it is absolutely certain that the product will retain all its original freshness and purity during shipment in Steri Seald lined Steel Drums and Pails.

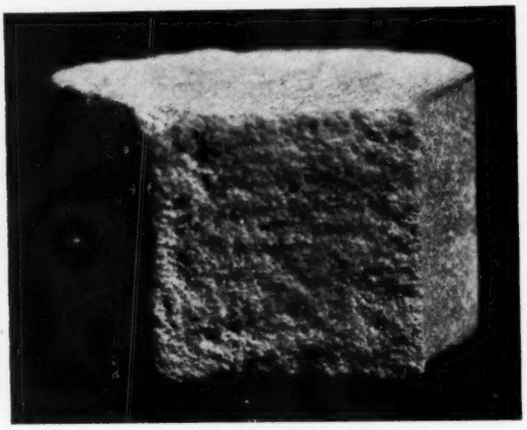
WILSON & BENNETT MANUFACTURING CO., CHICAGO, ILL.

Subsidiary of Inland Steel Company

Plants at Chicago, Jersey City and New Orleans • Warehouses in all principal cities

Makers of Steel Drums and Pails

SILICATE of SODA
FOR TREATING CONCRETE



Showing the minute cells in concrete
(Enlarged one and a half times)

THE technique of making concrete has been improved to such a degree that today interest is focused on the substances which, used in conjunction with concrete, enhance its useful properties.

Silicate of soda is one of the most useful of these accessory materials, but like the cement itself it yields the best results to those who thoroughly understand how it works.

In conjunction with concrete, silicate of soda has two distinct functions and it is well to define these clearly so as to avoid confusion. One use is for curing concrete, the object here being to produce a film on the surface of the concrete and to prevent penetration as much as possible. This tends to hold the water in the concrete, on which depends the maximum ultimate strength. The curing of concrete has been covered in our bulletin 31, "Curing Modern Concrete Roads," a copy of which will be furnished on request.

Another class of uses calls for penetration of the silicate into the concrete, and it is this that we shall discuss. Here the application is made after the Portland cement has taken its set, so that maximum reaction between the cement and silicate may be obtained.

THE POROSITY OF CONCRETE

All concrete is porous, although the porosity varies greatly in different concrete. This is due to the chemical and physical changes which take place as the concrete sets, but it is modified by the amount of working, the amount and kind of aggregate, temperature and various other conditions.

Look at the above photograph (enlarged one and a half times) and get a true picture of the tiny cells of which every bit of concrete is made up.

HARDENING CONCRETE

The stress of traffic such as trucks, vehicles, even foot traffic, causes wear. In many places you have observed concrete that was worn. As the conc[illegible] best results. This is very undesir[illegible] an a[illegible]

T[illegible] the [illegible] whi[illegible] By [illegible] ins[illegible] tic[illegible] so[illegible] Th[illegible] or[illegible] lo[illegible]

Fill up the pores in concrete with PQ Silicate to harden it against wear, acid corrosion, oil or water penetration. For instructions, send for Bulletin #341, of which page one is here reproduced—no obligation.

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory: 125 S. Third St., Phila., Pa. Chicago Sales Office: Engineering Bldg. Stocks in 60 Cities. Sold in Canada by National Silicates Ltd., Toronto, Ont.

Works: Anderson, Ind., Baltimore, Md., Chester, Pa., Buffalo, N. Y., Kansas City, Kans., Jeffersonville, Ind., Rahway, N. J., St. Louis, Mo., Utica, Ill. Established 1831

PQ

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CHANGING sources of supply and the need for finding substitute materials, and equipment, make the CHEMICAL INDUSTRIES BUYER'S GUIDEBOOK NUMBER the most valuable "guide" published for buyers of:

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Particularly important at this time is the fact that every issue is completely revised and brought up to date. All listings, including those on equipment and containers, are catalogued in alphabetical order with the names of manufacturers and recognized distributors under each item.

The formulas, uses, grades, physical and chemical properties, containers, shipping and tariff regulations are also given under each chemical and raw material. The uses of industrial chemical specialties are defined.

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See schedule of rates on page 470.

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The Most Complete Guide for Chemical, Equipment and Container Buyers

Complete buying guide for production and main nce

These are actual pages showing tent

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Buffalo, N. Y.

1294 Niagara St.

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For greatest effectiveness use a separate advertisement under each of your principal products "listed". Low cost reduces materially with increasing number of spaces used.

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nce executives, buyers, chemists and engineers!

tents of each buying section

Advertisers are listed in bold face type with complete street address and telephone number under EVERY product they make or regularly sell, at no additional charge.

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A Geographical List of All Chemical Manufacturers, Importers and Recognized Distributors of Chemicals, Chemical Raw Materials, and Specialties

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DRUMS
a complete line of light gauge containers
Full Removable Head
NTAINERS

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Amazed at amount of useful information.
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We would be slowed down very much without it.
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So useful.
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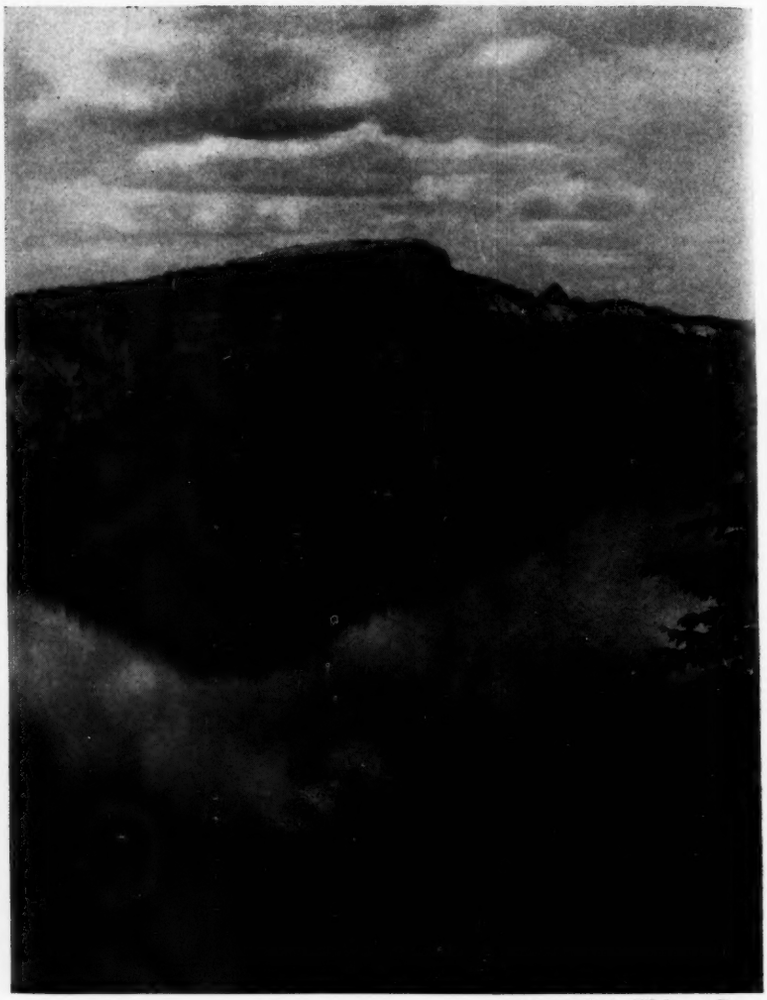

Oregon State Highway Dept.

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Natural BICHROMATE

When Will We Really Get Fighting Mad?

THE forty-hour-week issue is but a part of a more serious problem confronting our war leaders. Americans, despite the slogans "Remember Pearl Harbor" and "Too Little and Too Late," are still much too complacent, still too cock-sure that in our own good time we will punish the Japs for not playing "cricket" at Pearl Harbor.

How much deep-seated hatred of the Japs and of Hitler and all his satellites exists in the minds of Americans at this moment? Frankly not enough yet to win this war. Is the feeling of revenge the chief motivating thought? No, unfortunately it is not. We in civilian life are still largely concerned with profits, with working as few hours as necessary to maintain a high standard of living; we devote too much of our leisure to complaining about rationing programs on sugar, on gasoline, on tires; we are surprised at the sharp increase in the income tax but we are too "busy" with our daily occupations to take the trouble to write to our elected representatives to insist that economies be made wherever possible.

Is this charge lodged against a large portion of the American civilian population by the editors of this publication? Or by publicity seeking politicians? No, it is made by men who are directing America's supreme effort, by those upon whose shoulders rests the responsibility of defeating the most ruthless, the most brutal, and the most efficient war machine the world has ever seen.

Must there be other Pearl Harbors, other Singapores, other Javas closer to our own shores before the civilians of this country become fighting mad, determined to sacrifice every personal possession and advantage to win this battle for freedom? Will it take still greater disasters than these to arouse us to such a frenzied pitch that Americans will demand that inefficient management where it exists be supplemented by capable executives; that labor be made to work not less than 48 hours a week before overtime is paid; that politicians both in and out of the Administration be prevented from "playing politics" for the duration; that profits in war work be strictly limited, and that some form of so-called "Baruch Plan" of ceilings on prices, wages and profits be adopted before inflation gets entirely out of control?

Momentarily we are desperately in need of more positive action by the only forces who can take the initiative—the President, and his Administration and Congress. Possibly it is the unwillingness of either the President or Congress to insist upon a definite labor policy that is responsible at least in part for the apparent lethargy of the American public. Failure to do this has permitted the forty-hour week to become a political football.

The forty-hour week was instituted in the depression, largely as a measure of spreading work around to a greater degree. Now when a frightful scarcity of labor is delaying, yes even jeopardizing the war production program and the very safety of this nation, no legitimate excuse exists for not extending the labor week to a forty-eight hour minimum. Labor leaders' reply to this that there is nothing to prevent men from working forty-eight hours or even longer, is simply begging the question. They must know that in entirely too many instances labor is only willing to work a forty-hour minimum regardless of any inducements of overtime pay. They also know that skyrocketing the cost of this war will hit labor in the long run just as hard as any other group in this country. Labor leaders have a golden opportunity to initiate a forty-eight hour week for the duration. If they fail to do this voluntarily, it will be forced upon them eventually by an aroused public. By voluntary action or legislation we must "freeze" existing labor conditions for the duration or run the obvious risk of losing the war.

CI EDITORIAL

Walter J. Murphy, Editor

Smear Tactics Again: The same vicious formula of smear was used in Washington last month in the so-called "sensational disclosures" of the inner workings of patent agreements between Standard of New Jersey and the German I. G. as was so successfully employed a few months ago against a number of domestic concerns interested in the magnesium field. Arouse an uninformed public with half truths, feed the lay press with rabble-rousing material that headline writers can play up, distort the facts, suppress others, by innuendo at least imply treason. Why? Simply to send up a smokescreen to keep the public from learning the simple truth that the Administration failed miserably to appreciate the seriousness of the rubber situation in time, just as they did in magnesium and aluminum. Could the Administration afford to admit to the millions of automobile owners of this country (most all of whom are voters) that it had made a grievous error? Obviously not. Base politics of the cheapest kind called for something or some one to castigate outside of the New Deal oligarchy and industry was again selected as usual to be the victim.

Fortunately many of our leading dailies and national magazines were for one reason or another better informed on the synthetic rubber situation than they were on magnesium—or had learned to be less gullible when dealing with Washington propaganda handouts.

If the officials of the Standard Oil Company of New Jersey have been guilty of treasonable conduct then Mr. Arnold in his acceptance of a consent decree is deserving of serious rebuke. If they have not, then it is unfair to drag their names in the mud, especially in a war period when the words "unpatriotic" and "treason" can mean but just one thing.

Thousands and thousands of words have been spread across pages of the press of this country, thousands of words have been spoken over the radio, but with few exceptions has the American public been told the whole truth about the international patent situation.

Those who know about patents realize, of course, that under the long-standing international patent agreement citizens of certain other countries including Germany were permitted to obtain patents in this country. In turn, American citizens were granted equal rights in the countries who were parties to the international patent agreement. That Germany attempted to basely take advantage of this situation to improve her position militarily should have been the primary concern of a wide-awake American Government and any necessary steps taken to put an end to any patent prostitution for war purposes as long as five years ago when Hitler indicated in no unmistakable terms what his intentions were.

The United States, nor any other country for that matter, has any monopoly on technical brains. Under the international patent set-up some form of exchange or licensing of patents is necessary if the fruits of the work of the world's chemists, engineers and inventors are to be made of full practical value. It certainly appears in the case of Standard that we fortunately have gotten much more than we gave up, for all indications are that we will make much greater use of the "Buna" type of synthetic rubber, perfected in Germany, than the "Butyl" type, perfected in this country.

Is it primarily the fault of Standard of New Jersey that we do not now have in the United States a productive capacity of some 800,000 tons of synthetic rubber annually, an industry that would have cost fairly close to a billion dollars to have placed in operation? What incentive would any privately owned company have to venture into such a field when they would have been at the mercy of the natural producers? How could any board of directors justify such action when it is universally admitted that the cost of synthetic is at least twice what the natural was selling for in the period 1938-40 and that the price of natural rubber could be reduced materially and still yield a profit? Only a direct government subsidy or an indirect one in the form of a high protective tariff on natural rubber would have made it possible to develop synthetic rubber manufacture in this country to a point where we would be entirely independent of outside sources. Germany at Hitler's command did just that—and it was no deep dark secret—we neglected to do so and now are paying a terrible price. But that price is not half what it would be if we did not have here in this country at least the technical knowledge of how to make synthetic rubber. In this Standard Oil of New Jersey has contributed much to our present pool of information.

Nor is it fair to attack that company or any other company for seeking to hold on to the technical advantages that it possessed while we were at peace as long as this was done in a lawful manner. We do not believe that Standard deliberately attempted to sabotage the United States, nor that it has failed to give our Government full and complete cooperation once the officials of this Government indicated that a large-scale synthetic rubber program must be undertaken. And we honestly do not believe that the majority of the citizens of this country will believe otherwise either, once they have analyzed the situation.

President Roosevelt has taken a very wise and constructive step in seeking to call off for the duration the senseless "witch hunts" against industry. It is unfortunate that this decision was not reached sooner, for our war program could have been much further advanced than it is now. We thoroughly agree that deliberate flouting of anti-trust laws should be punished as soon as such actions are uncovered, but let us get on about our major business now of pinning Hitler's and Hirohito's respective ears back and leave the question of just how far industry should be "socialized" until such time as we can do our domestic wrangling in perfect safety in our own back yard.

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TYGON is available in many forms: in sheets for lining purposes or for gasket use; in liquid form as a protective surface coating; in more highly plasticized forms for moulding or extruding. A number of compounds are available for this latter purpose, providing a range from extremely hard to highly elastic products. TYGON extruded rods, for example, are extremely dense and easily machinable; while TYGON tubing will retain its resiliency indefinitely. Small parts moulded from TYGON are highly corrosion-resistant and possess excellent tensile strength. TYGON electrical insulating tape possesses all the qualities of ordinary tape, plus its corrosion-resistant qualities.

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The American BALANCE SHEET In Oils and Fats

By Walter J. Murphy, Editor

In Three Parts: Part One

Americans are now keenly aware that they face serious shortages of rubber and tin — they are not so well-informed about the equally difficult situation that we face in fats and oils, nor have they any clear conception of what steps are necessary to solve the problem. In a series of three articles the writer reviews the technological and economic aspects of this fascinating but little understood division of industry.

ABSOLUTELY vital in man's diet and essential in industry, fats and fat-bearing oils are a highly fascinating study alike to historians, scientists, and industrialists. The human race down through the ages has depended at least for a part of its sustenance on fats and oils won from the ground, from the beasts on land and the fish in the sea. For centuries man has cleansed his body and protected his possessions from the elements with materials produced in part from fats and oils. At birth the infant is bathed in oil; in the death chamber the flickering candle is symbolic of life and death and resurrection.

In this modern industrialized and chemicalized age man has discovered how to utilize fats and oils not only to protect his cherished possessions, but to enhance the beauty of his surroundings, and indeed, to provide new materials for his health, comfort and pleasure, and even instruction. A thousand years or more of great scientific and material progress has been recorded in the pages of history, many by the aid of the dim and smoke-clouded light of colza oil lamps, many by means of faint candlelight. Strange, indeed, that man now has chosen the dripless candle, the modern twentieth century version, as one of the "signs" of his great materialistic triumph. Still more strange, however, is the fact that despite that materialistic triumph self-evident in most parts of the world, there are still sections of Russia, Scandinavia, India, and China in which fatty oils are employed for burning in lamps.

Wars have been waged over fats and oils—at least for the possession of the means of producing them. Wars have been lost because of the lack of sufficient quantities. Germany is said by many experts to have lost World War I because of a serious deficiency in fats and oils; and the fats and oils "balance sheets" of the Axis and United Nations provide an insight into who will be the likely winner in the present titanic struggle.

Compared with cotton, rubber, camphor, copper, petroleum, and other well publicized industrial raw materials the fats and oils are practically unknown to the layman despite his constant daily contact with them. Several reasons are advanced why this is so, chiefly the one of his being "too close to the trees to be able to see the forest." More likely is the fact that our knowledge of the fats and oils is largely empirical. Their utilization has been largely an art rather than a science. Encouragingly it can be said with perfect truth that our technologists are reversing this situation with great rapidity.

The fats and oils are extremely complicated in their chemistry, in their physical properties, and in their commercial and industrial relationships. It may be stated that well over a thousand have been definitely identified, and of these some eighty or ninety are in sufficient commercial use as to be rated as important. They offer peculiarly inherent difficulties to complete and intelligent understanding on the part of the student, the scientist, the economist and the business man unless some very orderly procedure is at once adopted.

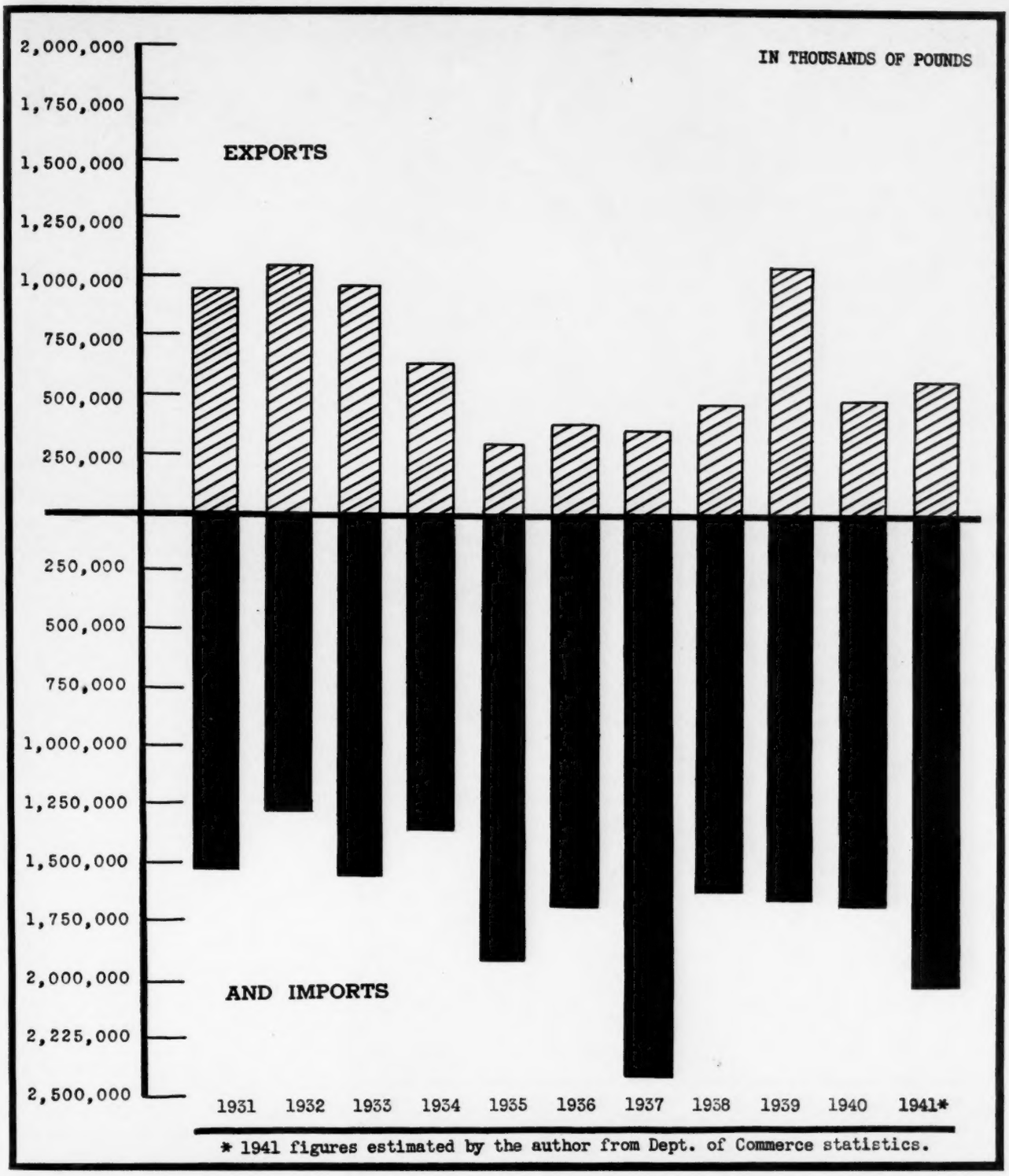
But first it is well to simplify matters by referring to the fats and oils as fats whether they are in the solid or liquid state where this is possible without sacrificing clarity of meaning. The fatty oils can well be termed "liquid fats" in many instances, and by so doing danger of confusing the reader with petroleum oils or the so-called non-fatty essential oils group is avoided.

The term "fats and oils" really makes a distinction without a real difference. Alsberg and Taylor express this exceptionally well: "The distinction between a fat and an oil is purely an accidental one depending upon the environment in which the substance happens to be placed. If the substance is solid at ordinary temperatures, it is termed a fat; if fluid, an oil. This is merely a distinction of convenience, since all oils are solidified at lower temperatures and all fats melt at higher temperatures." Therefore, "fats" and "oils" can be, and are, used indiscriminately.

Fats and oils, or simply fats, can be classified, arranged and studied in several different ways. First—possibly as edible or inedible. This is comparatively simple. Except in a minor way the edible grades are not of primary interest in this review of the balance sheet of United States fats for it is mainly with the industrial uses that we are concerned here. From a national or military viewpoint they are most important.

The distinction between edible and inedible it has been pointed out by chemists is purely one of taste since by modern methods nearly all fats can be refined or modified to the point of physiological edibility. The distinction is, therefore, based on such considerations as color, odor or taste, and origin. No amount of technical assurance of the edibility of a fat derived say from garbage would prove sufficient to overcome the natural prejudice that it is not fit to eat.

Second as to origin: They are obtained from the vegetable kingdom or the animal kingdom. Those from the latter can be subdivided into two groups, from marine mammals and from fish. Thus fats are either vegetable, animal or fish. Roughly fats can be classified as drying oils, semi-drying oils, or non-drying oils. Such



grouping is, of course, largely based on physical and chemical properties as related to use. Fourth, fats can be studied in relationship to specific industries, arbitrarily grouping those employed as foods, in the manufacture of soaps, in the production of coatings, and in a dozen different important fields of manufacturing. Fifth, fats can be studied from what may be termed their chemical "make-up" point of view. Finally modern technology is forcing still another grouping—various fat derivatives, and, indeed, no great stretch of the imagination is necessary to visualize still another grouping or method of classification—natural or synthetic.

The Vegetable Oils

Some eighteen or twenty different fatty oils or "liquid fats" of vegetable origin enter into world trade in substantial quantities in normal times. They come from every section of the globe, from the Far East, the South Sea Islands, from Russia, from Spain and China, from the Argentine, Canada and the United States. Every continent shares to some extent in production. They are secured from seeds, nuts, even from berries and roots. They are products of both annual and perennial plants of such different botanical groups as grains and legumes, palm and fruit trees. Some are grown as great commer-

Major foreign sources of U. S. imports of fats, oils and oil-bearing materials. 1940
(Courtesy, United States Tariff Commission)

cial crops. Others are byproducts. A few are recovered wastes. In commerce a number of vegetable oils, having interchangeable industrial uses, are in direct competition, while in important fields of consumption some of these liquid fats, because of certain chemical or physical characteristics, enjoy almost virtual monopolies.

Plainly the vegetable oil markets are complicated. In the interest of clarity it is well at the very outset to make some definitions and set up certain classifications within the vegetable fats that will permit simplification.

The vegetable fats can be divided into four groups dependent upon their botanical source.

1. Fats which are the principal products of annual plants, such as linseed, soybean, sesame, perilla, and rapeseed oils.
2. Fats produced as byproducts of annual plants, such as cottonseed and corn oils, and in this country, peanut oil.
3. Fats which are the principal products of perennial plants, such as cocoanut, palm, palm-kernel, and tung (chinawood) oils.
4. Fats which are byproducts of perennial plants, such as almond, apricot-kernel, grapeseed and raisin oils.

Making copra. Native splits the coconuts with "bolo" preparatory to the drying operation. Courtesy Philippine Refining Corporation, New York.

Our supplies of vegetable oils, based upon their geographical source, are domestic and imported. Some of the foreign oils we import directly as the oil itself, while the raw materials of others are brought in to the United States and processed into oils here. Some vegetable fats in normal times we both import and produce domestically. Some oils, like cocoanut, we import both as the finished or processed oil and also bring in the raw material, in this case copra, and process it into the oil in American plants. The economics and the availability of equipment and plant are, of course, the deciding factors.

The principal vegetable oils produced in this country are cottonseed, soybean, linseed, corn, and peanut. Oils imported include cocoanut, palm, palm-kernel, rapeseed, perilla, chinawood, castor and sesame. Linseed oil is the outstanding example of an oil pressed from raw material both grown in the United States and imported. Cocoanut is imported and also processed from copra in plants situated along both American coasts, the raw material coming in largely from the Philippines but also from other points in the Far East. Soybean is an oil which formerly was imported almost entirely from Manchuria, but which we now produce domestically in large and self-suffi-

cient quantities. Chinawood oil is still largely brought in from foreign sources (previous to the opening of hostilities on the Pacific), but we are building up both a domestic supply of raw material (from tung trees in the South) and a very capable processing industry for extracting the oil from the nuts. In very recent years both oiticica and babassu oils from Brazil have become increasingly important factors in the United States fats set-up.

The Animal Fats

It is quite plain that aside from the so-called milk fats (including, of course, butter) the utilization of animal fats involves the death of the animal concerned. It is quite plain then too that the period required for the production of fats (all kinds) varies literally from minutes to years. This is equally true of vegetable, animal and fish fats. This fact is just one more complication in the economics of fats and oils. Likewise it is true that economics dictate whether or not it is better to feed a vegetable fat to an animal with the idea of later slaying the animal in part at least for its fat content. Indeed the farmer, certainly the successful ones, must be somewhat of a practical economist to prosper.

Briefly and somewhat arbitrarily the animal fats can be classified: 1. Solid fats—the butter fats and the mammalian body fats, such as lard, beef and mutton tallow, bone fat, wool fat, or wool grease. There are liquid animal fats too, of course, including those that are classifiable as animal oils, such as neat's foot oil; as marine animal oils, such as whale oil; and as fish oils, such as herring, salmon, sardine and menhaden oils.

The common mammalian body fats are derived as follows: lard from pigs, beef tallow from cows and steers, mutton tallow from sheep, bone fat from both cattle and sheep, and wool fat and wool grease from sheep's wool. Neatsfoot oil is obtained from the feet of cattle, sheep, and horses.

The principal marine animal oils of marine mammalian origin include whale oil, seal oil, dolphin oil and porpoise oil. The principal marine animal oils of strictly fish origin include codliver oil, cod oil (a technical grade of codliver), herring oil, salmon oil, sardine oil, Jap Fish oil, shark oil, dogfish oil, and ray oil, the last two of relative little importance.

Vegetable vs. Animal Oils

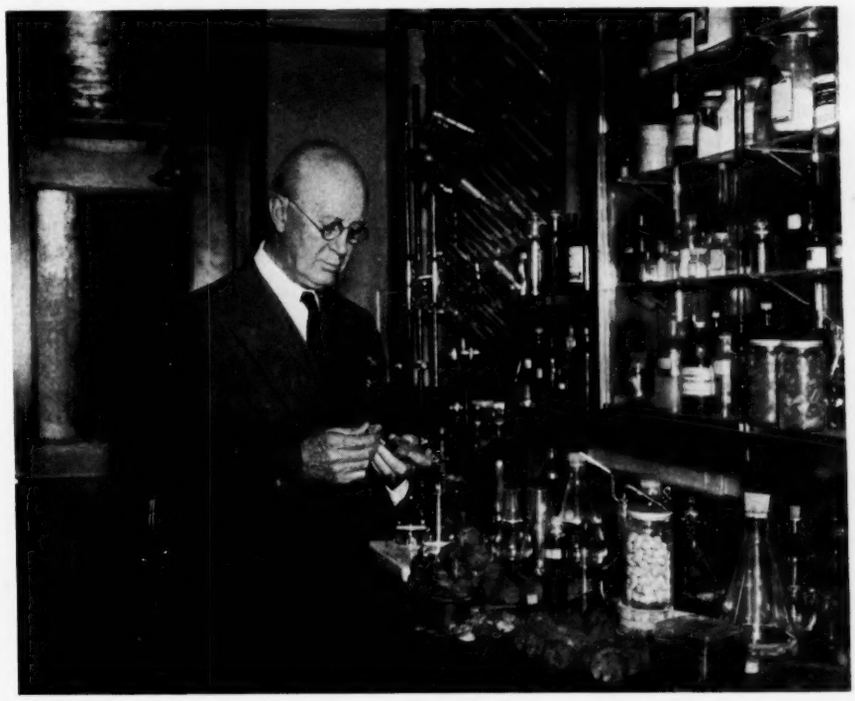
Two hundred, yes, even one hundred years ago, great portions of the earth's surface were devoted exclusively to raising cattle, sheep, and hogs. This was notably so in Western United States, in Australia, Canada, and South America. Slowly a change has taken place, a change which altered, among other things, the fundamentals of the fats industry.

Oiticica tree, Brasil Oiticica S. A., Fortaleza, State of Ceara, Brazil.

Crops have crowded in upon the animals. Millions of acres are now gashed by the chill of the plow that even fifty or seventy-five years ago felt but the beat of the hoof. This trend, definite and pronounced in all countries, has been particularly accelerated in the United States by remarkable increases in population brought about especially in the latter half of the 19th century and the first ten years of the 20th century by great influxes of peoples from Europe. Grazing lands under such changing conditions have given way in large volume to the insistent demand for more and more food in the form of wheat, corn, and other grains.

The practical effect on the fats of this agricultural evolution has been to promote the vegetable oils into a position of ever-increasing importance. This shift has been made, not always, but nearly always, at the expense of the animal oils and fats.

One need only go back to 1880 to find that much of our cattle and sheep were slaughtered for their hides and tallow. Meat was a byproduct. Meat is now the main product, even though in this country at least the per capita consumption of meat is said to be declining. But, of course, in the meantime our packers have learned how to extract everything but the squeal. The hides, the tallow, the fertilizer ingredients, the glue, and the gelatin have become the byproducts. Modern methods of transportation and refrigeration have made it possible to bring meat long distances to market. Cattle, hogs, and sheep have been bred carefully for years to develop types of animals that will bring the highest return in meat value, while the fats are largely inci-



Dr. Henry G. Knight, chief, Bureau of Agricultural Chemistry and Engineering, examining tung fruit dried in one of new type ventilating barns.

Fats and oils: Apparent consumption in the United States, by major classes of use—1940

Product	Food	Soap[1]	Paint varnish, etc.	Miscellaneous manufactured products	Total, all uses	Food	Soap[1]	Paint varnish, etc.	Miscellaneous manufactured products	Total, all uses
	Millions of pounds					Percent of domestic and foreign combined				
Domestic:										
Butter	2,299	....	....	....	2,299	35.2	....	....	....	23.5
Lard	1,925	1	....	....	1,926	29.5	0.1	....	....	19.7
Cottonseed oil	1,283	79	....	3	1,365	19.6	4.0	....	0.6	14.0
Tallow, inedible, and greases (except wool grease)	....	1,040	....	194	1,234	....	52.8	....	41.9	12.6
Soybean oil	392	44	43	19	498	6.0	2.2	5.4	4.1	5.1
Linseed oil	....	1	357	13	371	....	.1	44.6	2.8	3.8
Fish oils	11	89	46	34	180	.2	4.5	5.7	7.3	1.8
Corn oil	141	27	....	4	172	2.1	1.3	....	.9	1.8
Oleo oil and edible animal stearin	104	1	....	2	107	1.6	.1	....	.5	1.1
Tallow, edible	76	1	....	3	80	1.2	.1	....	.6	.8
Peanut oil	52	5	....	2	59	.8	.2	....	.5	.6
Marine animal oils	....	8	....	3	11	....	.4	....	.6	.1
Wool grease	....	....	....	7	7	....	....	....	1.5	.1
Fish-liver oil[2]	....	....	....	6	6	....	....	....	1.3	.1
Neat's-foot oil	....	....	....	4	4	....	....	....	.9	.1
Total	6,283	1,296	446	294	8,319	96.2	65.8	55.7	63.5	85.2
Foreign:										
Coconut oil	107	485	1	5	598	1.6	24.6	.1	1.1	6.1
Linseed oil	....	1	211	7	219	....	.1	26.3	1.5	2.2
Palm oil	42	101	....	[3] 37	180	.6	5.1	....	8.0	1.8
Castor oil	....	2	41	47	90	....	.1	5.1	10.2	.9
Tung oil	....	....	67	1	68	....	....	8.4	.2	.7
Babassu oil	13	47	....	....	60	.2	2.3	....	....	.6
Olive oil, edible	51	1	....	1	53	.7	.1	....	.2	.5
Fish-liver oil[2]	....	....	....	39	39	..	.	....	8.4	.4
Olive oil, inedible (including sulfur and foots)	....	18	....	5	23	....	.9	....	1.1	.2
Marine animal oils	....	16	....	6	22	....	.8	....	1.3	.2
Perilla oil	....	....	19	....	19	....	....	2.4	....	.2
Oiticica oil	....	....	16	....	16	....	....	2.0	....	.1
Cottonseed oil	13	....	....	....	13	.2	....	....	....	.1
Rapeseed oil	....	....	....	13	13	....	....	....	2.8	.1
Palm-kernel oil	8	1	....	....	9	.1	.1	....	....	.1
Sesame oil	4	1	....	....	5	.1	.1	....	....	.1
Soybean oil	5	....	....	....	5	.1	....	....	....	.1
Cashew nut-shell oil	....	....	....	5	5	....	....	....	1.1	.1
Teaseed oil	4	....	....	....	4	.1	....	....	....	.1
Peanut oil	3	....	....	....	3	.1	....	....	....	.1
Wool grease	....	....	....	3	3	....	....	....	.6	.1
Butter	1	....	....	....	1	....	....	....	....	....
Total	251	673	355	169	1,448	3.8	34.2	44.3	36.5	14.8
Total, domestic and foreign	6,534	1,969	801	463	9,767	100.0	100.0	100.0	100.0	100.0
	Allocation of apparent consumption according to uses, 1940 Millions of pounds					Percent of respective total				
Domestic fats and oils	6,283	1,296	446	294	8,319	75.5	15.6	5.4	3.5	100.0
Foreign fats and oils	251	673	355	169	1,448	17.3	46.5	24.5	11.7	100.0
Total	6,534	1,969	801	463	9,767	66.9	20.2	8.2	4.7	100.0

[1] The figures in this column include not only fats and oils, but also the foots derived from them.
[2] Cod and cod-liver oils only.
[3] The tin and terne plate industry reported a consumption of 31 million pounds.
Source: The figures for consumption are those of apparent disappearance as reported by the Bureau of Agricultural Economics, U. S. Department of Agriculture, and the allocations to various uses are approximately on the same ratio as the factory consumption of fats and oils as reported by the U. S. Bureau of the Census.

(This and other tables in this article are published through the courtesy of the United States Tariff Commission.)

dental. One needs but compare the bacon type of hog with the lard type, or the modern "whiteface" with the Texas "longhorn" to appreciate the deep significance of this gradual change-over.

When the growth of the soap, margarine, and lard compounds industries really began to accelerate at a rapid pace it was mainly to the vegetable oils that the producers turned. Cost dictated that they must employ cottonseed, cocoanut, palm-kernel and other vegetable oils so the technologists perfected the requisite processes, such as hydrogenation, which made their use commercially feasible.

It would be distinctly erroneous, however, to deduct from these statements the fact that the animal oils and fats are of but minor importance. The discussion is simply one of relative relationships.

Drying, Semi-Drying and Non-Drying Oils

Next in order is a brief classification of oils in relation to their value as "drying" oils. A wholly unscientific but perhaps understandable explanation to the layman of what a "drying" oil is, is contained in Hilditch's "The Industrial Chemistry of the Fats and Waxes" and he states, "As the iodine absorption or, rather, the mean unsaturation of the fats increases we pass from those which are mainly useful for soaps to others which, while frequently components of soft soap, are chiefly employed in the paint and varnish industries as vehicles which on exposure in a thin layer to air set to a hard vitreous film, owing to absorption of atmospheric oxygen." This property is roughly proportionate to the iodine absorption capacity of oils, most marked in the best "drying oils" with percentage iodine absorption of 130-180, less so in the "semi-drying" oils with iodine values of 100-140, and missing in the so-called "non-drying" oils with iodine absorption below the range of 100-110.

Rancidity is closely allied, of course, with oxidation. Hence it can be said broadly that the non-drying oils are chiefly those used as edible oils, also in soap-making. It must be borne in mind, however, that these groups merge on rather indefinite lines of demarcation. Hence an oil like soybean is classifiable as both a drying or a semi-drying oil and in a pure state as an edible oil.

Principal Oils in Each Group

The principal drying oils of vegetable origin include linseed, chinawood, oiticica, perilla, poppyseed, walnut, hempseed, safflower, and soybean.

The principal semi-drying oils of vegetable origin include cottonseed, corn, wheat, kapok, sesame and sunflower-seed.

The principal non-drying oils or fats of vegetable origin include cocoanut, palm, palm-kernel, babassu, cacao butter, olive, peanut, castor, almond, apricot kernel, peach kernel, rape or colza, and mustard seed oil.

Not all the 700 to 800 million pounds of oils employed in the United States each year as "drying oils" are, however, of vegetable origin. Specially processed fish oils find application in this group and for certain types of paints, for example, processed fish oils are highly desirable in their formulation. Nevertheless, the overwhelming quantity of oils used in industry for their drying qualities are vegetable oils, largely linseed, tung or chinawood, and perilla. Linseed oil consumed generally more than equals the volume of all the others. And as to the all-important balance sheet we in normal times import more than half of our drying oils either in the form of oil or in the state of oil-bearing seeds or nuts.

The Chemical Nature of Fats

Chemically fats are complicated, and necessarily any discussion here must perforce be somewhat sketchy or perhaps a better word is "highlighted." Indeed such chemistry as is reviewed is done only to the extent necessary to provide a background for understanding certain com-

mercial angles of the fats markets. Since considerable substitution of one fat for another in industry goes on incessantly as prices and supplies of fats change, it is quite apparent that a knowledge of the chemical and physical properties of fats is quite important to a thorough understanding of the "'whys" and "wherefors" of the merchandising, purchasing and use of fats.

Hilditch defines fats as naturally occurring esters of higher, saturated or unsaturated, paraffin monocarboxylic acids; the acids combined most usually with the trihydric alcohol glycerol, but also in quite large amounts with alcohols of closely similar structure to the acids or with other alcohols of a more complex type, such as cholesterols or phytosterols.

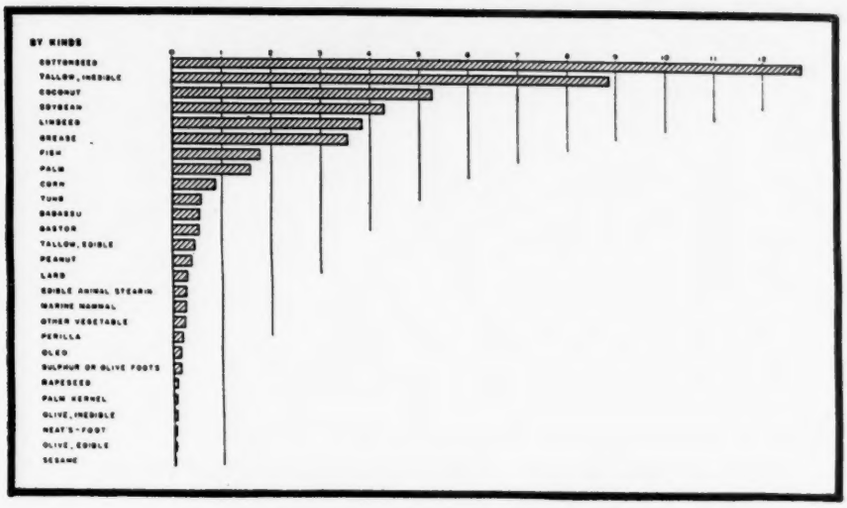
The same author goes on to say further: "The properties of the fats or glycerides, more especially, are very definitely associated with the fatty acids of which they are esters. Broadly speaking, these fall into two classes, the saturated and the unsaturated fatty acids; both consist of long chains of carbon atoms strung together with an acidic or carboxyl (—COOH) group at one end of the molecule. In nearly all cases the carbon chains are consecutive; in other words, each carbon atom is attached only to two other carbon atoms, the remaining valencies being satisfied by hydrogen atoms or left unsatisfied (ethylenic linkage)."

Describes Drying Oils

Sorensen describes the drying oils as "mixed glycerides of saturated and unsaturated fatty acids, and the properties of the individual oils depend upon the type and proportion of the constituent acids making up the oil. With the exception of tung, oiticica, and fish, all the oils described are made up of mixtures of palmitic, stearic, oleic, linoleic, and linolenic acids with minute amounts of arachidic, lignoceric, and other acids sometimes present. The amounts of the latter group are too small to influence the properties of the oil. In addition to some of the above acids, tung oil contains the triply conjugated eleostearic acid, oiticica oil contains the triply conjugated keto acid known as licanic, and the fish oils contain the highly unsaturated straight chain acids of 20, 22, and 24 carbon chain lengths, such as clupanodonic." . . . . "The oils are made up not only of mixtures of fatty acids, but also of mixed triglycerides, i.e., two or more types of fatty acid attached to the same glycerol molecule. This makes separation of one kind of fatty acid from another impossible unless the oil is first split into glycerol and fatty acids."

Upon this fact depends much of the very recent technological developments in fats reported. The chemist has learned how through utilizing such chemical unit operations as fractional crystallation, or precipitation, or separation after bromination, to take a fat or oil apart and then to knit it together again rejecting components that are responsible for undesirable properties. Needless to say if the chemist can perform this miracle with a single fat or oil he can also do a very practical job in bringing together the desirable properties of two or more oils while rejecting the unwanted portions.

The preceding paragraph may well be, to borrow a phrase coined by Williams Haynes, "thoroughly unscientific oversimplification" but it does indicate to the lay reader that after thousands of years the fats technologist like his fellow-scientific workers in so many other fields has finally managed to throw off the limitations imposed by Mother Nature and in accomplishing this feat has opened wide the doors to a heretofore tightly sealed stronghold. As yet comparatively little has been catalogued of the total treasure



U. S. Consumption of Fats and Oils, 1940
(Vertical lines indicate 100,000,000 lbs.)

Fats and oils: United States production from domestic raw materials, 1931-40

(In millions of pounds)

	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940[1]
Animal fats and oils:										
Butter[2]	2,214	2,283	2,349	2,253	2,184	2,152	2,132	2,286	2,248	[3]2,295
Lard[4]	2,279	2,351	2,446	2,066	1,267	1,673	1,412	1,708	1,992	[3]2,290
Tallow, edible	70	53	58	78	74	98	78	93	94	79
Tallow, inedible, and greases (excluding wool grease)	885	847	933	1,000	667	817	855	929	1,127	1,374
Wool grease	9	6	8	5	10	7	8	5	7	10
Oleo oil	94	75	89	79	75	98	75	88	76	69
Stearin, animal, edible	47	36	39	34	42	49	44	46	38	38
Neats-foot oil	4	4	5	7	6	6	5	4	5	4
Total	5,602	5,655	5,927	5,522	4,325	4,900	4,609	5,159	5,587	6,159
Marine animal oils:										
Fish oil	64	85	129	216	228	266	196	202	237	149
Fish-liver oil[5]	1	1	1	1	2	3	3	4	5	6
Marine mammal oil	[6]	6	4	9	10	32	71	60	28	20
Total	65	92	134	226	240	301	270	266	270	175
Vegetable oils:										
Corn	113	106	129	115	100	127	127	137	151	158
Cottonseed	1,417	1,571	1,400	1,224	1,184	1,247	1,626	1,678	1,390	1,273
Linseed[7]	364	192	195	111	81	243	84	121	126	341
Olive oil, edible	2	1	2	1	1	4	2	5	7	4
Peanut	14	13	13	47	45	70	51	78	73	83
Soybean	39	39	27	35	105	225	194	323	458	537
Tung	....	....	....	....	....	....	....	....	3	[3]1
Total	1,949	1,922	1,766	1,533	1,516	1,916	2,084	2,342	2,208	2,397
Total including butter and lard	7,616	7,669	7,827	7,281	6,081	7,117	6,963	7,767	8,065	8,731
Total excluding butter and lard	3,123	3,035	3,032	2,962	2,630	3,292	3,419	3,773	3,825	4,146

[1] Preliminary.
[2] Total factory and farm production.
[3] Estimated.
[4] Lard and neutral lard produced under Federal inspection and other production.
[5] Includes oil made from imported livers.
[6] Less than 500,000 pounds.
[7] Oil equivalent of flaxseed produced the preceding year minus seed requirements for the year shown.

Source: U. S. Department of Agriculture, Bureau of Agricultural Economics.

Relative consumption of domestic and foreign fats and oils in principal uses, 1938-40.

Use	Quantity			Proportion		
	1938	1939	1940	1938	1939	1940
	Million pounds			Percent		
Food:						
Butter—Total	2,204	2,309	2,300	100.0	100.0	100.0
Domestic	2,202	2,308	2,299	99.9	100.0	100.0
Foreign	2	1	1	.1	..	..
Lard, used as such—Total (all domestic)	1,457	1,657	1,896	100.0	100.0	100.0
Shortening—Total	1,878	1,720	1,478	100.0	100.0	100.0
Domestic	1,600	1,529	1,394	85.2	88.9	94.3
Foreign	278	191	84	14.8	11.1	5.7
Oleomargarine—Total	313	243	257	100.0	100.0	100.0
Domestic	207	190	229	66.1	78.2	89.1
Foreign	106	53	28	33.9	21.8	10.9
Other edible products—Total	470	514	603	100.0	100.0	100.0
Domestic	180	313	436	38.3	60.9	72.3
Foreign	290	201	167	61.7	39.1	27.7
All edible products—Total	6,322	6,443	6,534	100.0	100.0	100.0
Domestic	5,646	5,997	6,254	89.3	93.1	95.7
Foreign	676	446	280	10.7	6.9	4.3
Soap—Total	1,847	1,963	1,969	100.0	100.0	100.0
Domestic	1,227	1,240	1,296	66.4	63.2	65.8
Foreign	620	723	673	33.6	36.8	34.2
Paint, varnish, etc.—Total	684	811	801	100.0	100.0	100.0
Domestic	259	331	446	37.9	40.8	55.7
Foreign	425	480	355	62.1	59.2	44.3
Miscellaneous manufactured products—Total	408	451	463	100.0	100.0	100.0
Domestic	265	255	294	65.0	56.5	63.5
Foreign	143	196	169	35.0	43.5	36.5
All uses—Grand total	9,261	9,668	9,767	100.0	100.0	100.0
Domestic	7,397	7,823	8,290	79.9	80.9	84.9
Foreign	1,864	1,845	1,477	20.1	19.1	15.1

Sources: The figures for consumption, except for oleomargarine, are those of apparent disappearance as reported by the Bureau of Agricultural Economics, U. S. Department of Agriculture. Statistics of consumption of oleomargarine are based on consumption data supplied by the U. S. Treasury. The allocations of fats and oils to various uses were calculated on the basis of factory consumption, as reported by the U. S. Bureau of the Census.

stored there by Nature, but it can be safely said that today the industry is no longer chained to the "black magic" of an art but is free, free to progress and to improve along thoroughly modern scientific lines of approach.

It is plain that a natural fat (solid or liquid) can contain more than just one fatty acid. The fatty acids are roughly divided into two groups: saturated and unsaturated. To again turn thoroughly unscientific for a moment for the benefit of the non-technical reader it can be said that by unsaturated is meant that additional hydrogen atoms can be introduced.

The principal saturated fatty acids are n-butyric; iso-valeric; n-caproic; n-caprylic; n-capric; n-lauric; n-myristic; n-palmitic; n-stearic. N-butyric is found only in milk and butter fats. N-lauric is found in abundant quantities in cocoanut, palm and palm-kernel oils. Fats with high lauric acid content are desired by the "soaper" for its sodium salt is fairly soluble and lathers well. N-Myristic is rather widely found in cocoanut, palm-kernel, whale, and fish oils, and in most tallows. N-Palmitic is the most abundant and widely distributed of the natural fatty acids. Its sodium salt (a soap in other words) is not quite as soluble as those containing myristate and/or laurate. N-Stearic is also very abundant but specially so in the lards and tallows.

The two perhaps most important unsaturated acids are linoleic and linolenic and certainly oleic is the most abundant in nature. The presence of highly unsaturated acids characterize the semi-drying oils and to an even greater extent the drying oils.

For the sake of being complete, although very brief, it is necessary to mention that three distinct types of alcohols are found in fats and waxes. The most important by far is the trihydric alcohol glycerol and is the explanation why the glycerine of commerce is a byproduct of the soap industry. For this discussion the other two alcohols are of little or no importance, other than to say that they are sources of vitamins A and D.

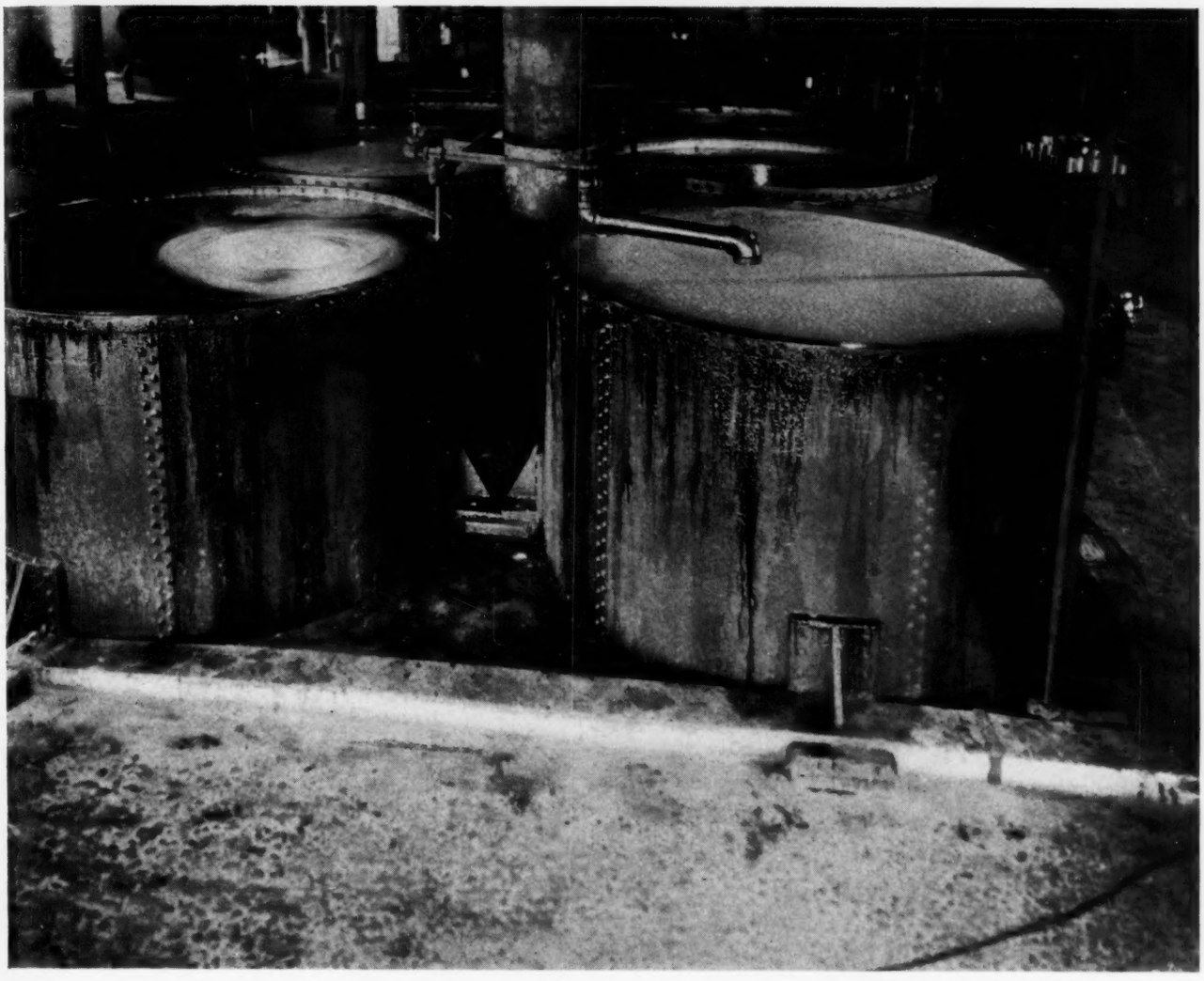
Interchangeability Factors

The interchangeability of fats (solid and liquid) is often a complicated factor. While it is true that such direct competition exists between different products, often between not only oils in one classification as, for example, vegetable, but also between fats in all three classifications, vegetable, animal, and fish, it is certainly not true that substitution can be carried on indiscriminately.

But prices are all brought more or less in direct relationship, and the determining factors in the decision of the fats user, aside from the price consideration, are the amount of refining necessary to fit any oil for a given use, the character of the finished product, and in some cases the byproducts that are derived. Each oil or fat has its own very definite characteristics. Some very definitely are not interchangeable; others have properties so similar that they may be quite freely substituted one for the other. A number of oils are interchangeable only in the sense that any substitution involves a serious change in the method of use or in the character of the finished product.

Several technical factors enter into any consideration of interchangeability. These are briefly: 1. The melting points; 2. Chemical saturation; 3. Saponification value; 4. Color, odor, and taste; 5. Free fatty acid content; 6. The content of moisture and unsaponifiable matter.

The melting point of a fat often sets



Holding tank for crude fatty acids. (Armour & Co.)

definite limits to its possible applications. So-called "saturation" is measured by the iodine number or value, representing the amount of iodine which a given quantity of an oil will absorb and is a definite indication of how much hydrogen will readily combine with it. Accordingly, the iodine number provides an excellent indication of an oil's hydrogenation possibilities as well as its drying qualities. The saponification value is a measure of the amount of alkali that will be necessary for saponification, invaluable data for the soapmaker whose alkali costs are a major item of expense.

The limitations placed upon an oil by color, odor, and taste are quite obvious. High free fatty acid content usually forecasts quick rancidity. High moisture content and a great percentage of unsaponifiables are naturally objectionable in nearly all instances.

If the fats user is making soap, he is always interested in lathering qualities; if he is in the paint, linoleum, or ink fields, the drying properties are the most important factor he considers; if he is in the food industry he is concerned with the sharpness of the melting point along with other technical indications of the basic properties of the fats he proposes to substitute for the ones with which he is familiar.

Common Production Methods

Very naturally the first matter of importance is the quality of the raw material from which fats are to be secured no matter whether such raw material is of vegetable, animal or fish origin. Decay and putrefaction must be avoided and, of course, doubly so where edible oils are concerned.

Secondly non-fatty bodies adhering in one way or another to the actual fat must be removed by some means or other, usually mechanical in nature. Thus it is evident that the technology of fat extraction is almost as much a mechanical problem as a chemical or chemical engineering problem.

The actual fat-extraction operation is usually carried out in one of three ways:

1. Expression, using presses and pressure.
2. Solvent Extraction.
3. Rendering, heating the fatty mass either with or without the presence of water until the liquid fat is released from the cells which enclose it.

The matter of selecting which one of the three procedures is followed depends on a number of factors, including the ultimate use planned for the fat, the matter of byproducts, etc.

Considerable emphasis is placed on the preliminary milling operation. Various types of specially designed crushing machinery are employed, the optimum being a machine that will supply fine flaky particles without any rupture of the cell structure and a loss of fat before the raw material reaches the extraction process.

Pressure extraction is carried out in either of two ways—cold pressing where the raw material is placed directly into presses, or hot-pressing where a preliminary "cooking" operation is effected in steam-jacketed closed vessels equipped, of course, with stirrers.

The advantages and disadvantages of the pressure and solvent-extraction processes may be briefly summarized as

Vegetable oils and oil-bearing materials[1]: Principal suppliers of specified imports into the United States in 1940

(In thousands of pounds)

Oil (imported as such or derived from imported raw material)	Total	Japan and Kwantung	China and Hong Kong	Philippine Islands	Netherlands Indies	British India	British Malaya	Oceania	Nigeria	Other British West Africa
Coconut[2]	758,365	....	....	731,606	17,439	....	....	9,215	....	....
Palm	226,854	....	....	....	180,243	....	....	....	4,844	8,448
Linseed[3]	225,167	....	301	....	....	....	....	....	....	....
Castor[3]	107,055	....	39	....	296	32,189	....	....	....	....
Tung	97,049	....	97,049	....	....	....	....	....	....	....
Olive	79,696	....	....	....	....	....	....	....	....	....
Babassu nut[3]	62,803	....	....	....	....	....	....	....	....	....
Oiticica	15,537	....	....	....	....	....	....	....	....	....
Palm kernel[3]	13,173	....	....	11	10,992	....	2,164	....	....	....
Rapeseed	12,919	11,595	....	....	....	....	....	....	....	....
Cottonseed	12,031	671	....	....	....	....	....	....	....	....
Perilla	11,347	11,227	120	....	....	....	....	....	....	....
Total	1,621,996	23,493	97,509	731,617	208,970	32,189	2,164	9,215	4,844	8,448

Oil (imported as such or derived from imported raw material)	Belgian Congo	Tunisia	Brazil	Argentina	Uruguay	Italy	Spain	Portugal	Greece	All other
Coconut[2]	....	....	....	....	....	....	....	....	....	105
Palm	32,724	....	....	....	....	....	....	....	....	595
Linseed[3]	....	....	....	187,958	35,811	....	....	....	....	1,097
Castor[3]	....	....	73,414	....	....	....	....	....	....	1,117
Tung	....	....	....	....	....	....	....	....	....	....
Olive	....	2,308	....	....	....	14,335	5,857	9,029	44,309	3,858
Babassu nut[3]	....	....	62,803	....	....	....	....	....	....	....
Oiticica	....	....	15,537	....	....	....	....	....	....	....
Palm kernel[3]	....	....	....	....	....	....	....	....	....	6
Rapeseed	....	....	....	1,324	....	....	....	....	....	....
Cottonseed	....	....	11,360	....	....	....	....	....	....	....
Perilla	....	....	....	....	....	....	....	....	....	....
Total	32,724	2,308	163,114	189,282	35,811	14,335	5,857	9,029	44,309	6,778

[1] Each individual amount shown in the table represents the quantity of oil imported plus the oil equivalent of the seeds or nuts imported and crushed for oil. The yields of the various oil materials used in the computations are shown in the appendix table to this report.
[2] Imported approximately half as oil and half as copra.
[3] Imported entirely or almost entirely in the form of seeds or nuts.
Source: Compiled from official statistics of the U. S. Department of Commerce.

follows: Generally speaking the cost of the necessary hydraulic pressure extraction system is greater than for a solvent-extraction plant of equal fat capacity. It is held by many that the oil obtained in the pressure method is superior, lacking any contamination with a solvent. The pressure method also yields directly a compressed cake suitable for feeding to cattle. Finally with certain solvents there is the fire and explosion hazard present.

Mention should be made of what is generally classed as a form of pressure extraction — extraction by "expellers." These are screw presses and operation is continuous. Usually each such unit has a heating kettle for preliminary cooking purposes. In many plants working on material high in fat content, such as copra, a combination of the expeller principle and hydraulic presses or solvent extraction is employed. A preliminary working through an expeller reduces the fat content down to a point where the hydraulic press or solvent-extraction methods operate more efficiently.

Rendering is pretty much an exclusive method in the treatment of animal fats and marine animal fats, notably whale oil. Either open digesters or autoclaves are used, better grades coming usually from the former. Water is or is not used in the open digesters and autoclaves depending upon the end product. The highest qualities of edible lard and certain tallows are produced in open digesters and without water being added. The open digesters are equipped with mechanical agitation and with the necessary equipment for skimming off the liquid fat.

Refining of Fats

Fats whether expressed, solvent-extracted or rendered have considerable impurities of several kinds and in various stages or forms. Refining processes are required to correct such conditions. The refining of fats and the changes so wrought in their quality are naturally of prime importance; accordingly the user, as well as the supplier, often demands information on the methods that have been employed. There are seven common treatments briefly summarized as follows:

1. Coagulation and settling. The crude material is allowed to coagulate cold or can be heated with or without water or brine.
2. Neutralization with an alkali followed by decantation or filtering. The purpose of treating with an alkali is to remove free fatty acid and to obtain a neutral fat. Improvement in color is also usually achieved in this operation.
3. Filtering, an operation which is largely one of bleaching, usually employed only after coagulation and/or neutralization.
4. Bleaching with oxidizing or reducing agents. Sometimes a violent agent, such as concentrated sulfuric is used to obtain definite decomposition.
5. Deodorization by passing superheated steam through the material while under vacuum.
6. Stearin separation through cooling and pressing, followed by decantation.

Hydrogenation, or the process of introducing additional hydrogenation atoms, introduced about 1910, and constituting one of the most outstanding technical developments in the technology of fats, is hardly to be considered a process of refining in the usual sense, yet in another it very definitely is.

Simple coagulating, settling and filtering is most often employed where the fat is of high quality and is also later to be further refined by the alkali method. It is used widely in the refining of edible oils and in the clarification of palm oil, soybean oil, whale oil, fish oils, and tallows of good grades.

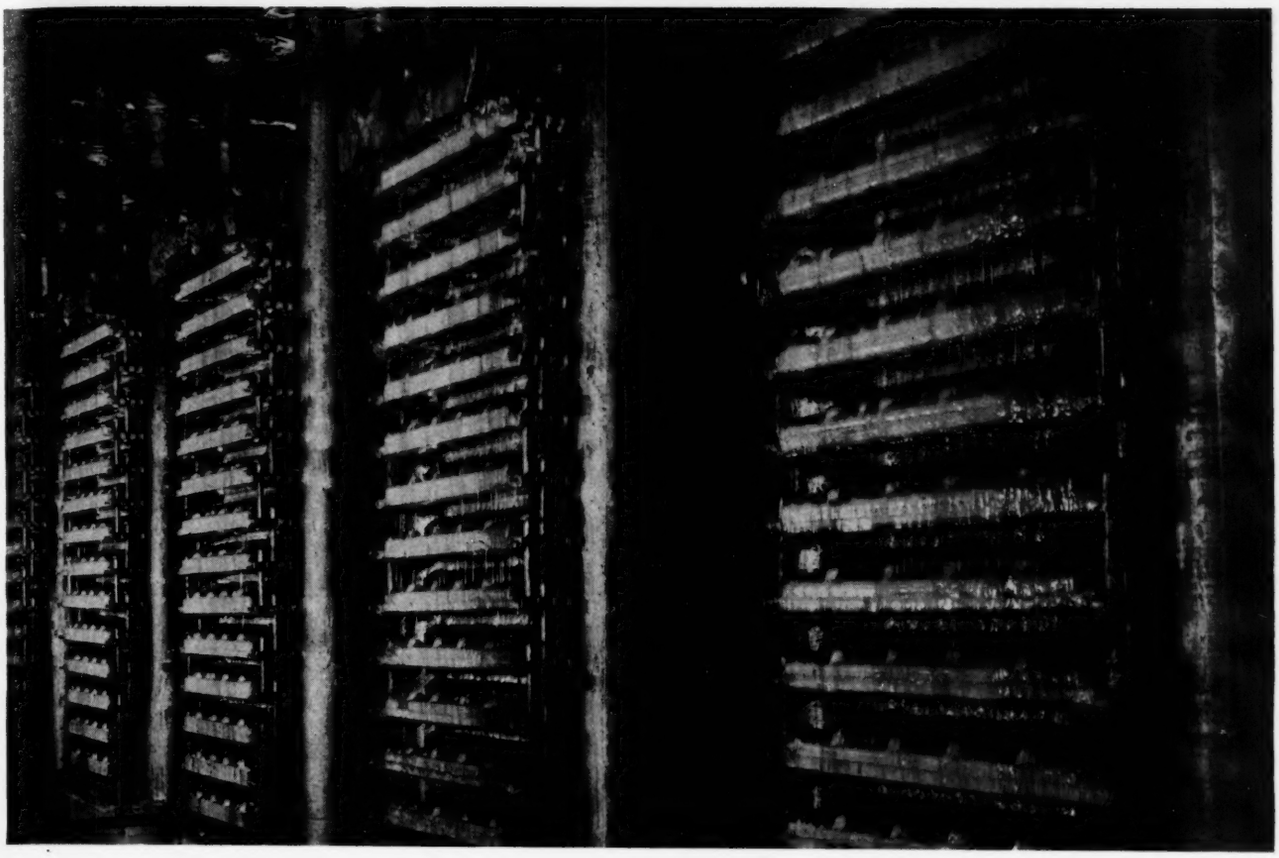
Filtering or adsorption methods are extensively employed in the industry. Treatment is usually in cylindrical vessels with a capacity generally of from five to twenty-five tons of oil. Steam coils are provided and mechanical agitators utilized. The adsorbents most generally employed are bone charcoal, animal charcoal, activated charcoals, Fuller's Earth, and silica gel.

The adsorption process is most often employed as follows: clarification and bleaching of alkali-refined high grade fats such as cocoanut, cottonseed, palm-kernel; clarification of crude fats, such as whale, linseed, soybean, etc., generally prior to other further treatment; bleaching of tallows for soap and candle making; bleaching of colored vegetable liquid fats.

Chemical bleaching is accomplished in several ways. 1. By using air as an oxidizing medium; 2. By using ozone; 3. By using hydrogen peroxide; 4. By using bichromate and acid. Strictly as a generality it may be said that chemical bleaching is fairly well limited to the non-edible oils. It is obvious that this operation does not remove but essentially changes the composition of the impurities contained in the oil.

The alkaline treatment is usually carried out in cylindrical vessels of from five to twenty-five tons capacity and heating coils and means of agitation are supplied.

Soda ash, caustic soda or lime are the alkali mediums most generally used. The neutral oil is taken off at the top and the so-called "foots" or oil emulsion is withdrawn as a thick heavy mass at the bottom. Oils most often treated by the alkali method are cottonseed, linseed, soybean, and marine animal and fish oils. The "foots" find a ready market with "soapers" and is usually called such-an-such-an-oil soap stock. In modern plants continuous alkali refining processes are in operation. The equipment briefly consists of a mechanical mixer for the oil



Crude cottonseed oil flowing from the presses. (National Cottonseed Products Association.)

and the alkali, a tubular heater through which the emulsion of oil and alkali is quickly brought to a temperature of about 85-95° C., and finally high-speed centrifugal machines or separators in which the neutral oil is first separated from the soap stock and then washed with water while again being centrifuged.

The process of deodorization is pretty generally limited to edible fats and oils, and consists of steam distillation at very high temperatures while under reduced pressure.

Hydrogenation of liquid fats in the presence of such catalysts as nickel, copper, platinum, or palladium into more valuable solid fats, a development introduced first about 1911 has revolutionized the industry. Certainly its effect on the market for lard was tremendous when it permitted the large scale introduction of the so-called vegetable shortenings for cooking. Hydrogenation also started margarine as a competitor of natural butter.

The actual production technique of hydrogenation is well beyond the scope of this discussion. Also considerable secrecy surrounds much of the details of operation. Suffice to say that in general three methods are employed: the first, the agitation process in which mechanical agitation is used to obtain intimate contact between the liquid fat, the hydrogen and the catalyst. Second, what is usually termed the injection or circulation process in which the liquid fat and catalyst is taken from the lower part of the reaction vessel and injected as a fine spray into a gas-space at the top. Third, the continuous process in which the liquid fat passes down over a stationary catalyst while a current of hydrogen is forced up through the chamber.

Improved technique in the science of hydrogenation continues as the patent literature indicates and the products of hydrogenation plainly demonstrate. In the past decade it has been found possible to produce the very important higher fatty alcohols by hydrogenating fats with a suitable catalyst at 200-250° C. and at very high pressures of 100-200 atmospheres. The higher fatty alcohols are valuable as waxes with special properties; also their hydrogen sulfates and hydrogen phosphates yield alkali salts which are finding wider and wider applications as emulsifiers, wetting agents, and detergents. By fractional distillation under reduced pressure the separation of the individual alcohols can be accomplished.

Production of Fatty Acids

Fat-splitting, and called hydrolysis, is the procedure of separating fats into their component parts—fatty acids and alcohol. Of course this has been done for centuries in soap-making. An alkali is used in soap manufacture to saponify the fatty acids present. Crude glycerol (glycerine) is the byproduct. In more recent years means have been evolved for obtaining fatty acids and industrial applications are constantly being developed for these. Improvements in high pressure equipment have permitted great strides in hydrolysis of fats.

Thus we visualize even in this very sketchy and incomplete review of present methods of production of fats and oils that tremendous strides have been made in the years between the era when soap-making was strictly a home chore and the present when one may stand at one end of the soap-kettle floor of the largest soap-making plant in the United States and be unable with the naked eye to see the other end of the building. Mass production made possible by mechanical improvements as well as chemical discoveries, slow at first, to be sure, but increasing at an ever-accelerating pace, are giving not only the soaper and the paint maker, but the doctor, the baker and the candlestick maker products with which to better apply their respective talents. And even the lawyer has fared not too badly, for all this improvement in technique has not been without opposing claims and counterclaims and patent litigation.

(Part 2 will appear in May.)

PERSONALITIES in CHEMISTRY
ALEXANDER CUTHILL FERGUSSON
– FOR MORE THAN 50 YEARS HE HAS SERVED THE ALEX C. FERGUSSON COMPANY, OF PHILADELPHIA !!
I'LL HAVE TO HUSTLE TO KEEP FROM FREEZING !!
HE STARTED WORKING FOR HIS FATHER'S COMPANY IN 1892 AT $3.50 PER WEEK – IT WAS OFTEN AS COLD AS 10 DEGREES BELOW ZERO ON THE WINDY WHARF WHERE HE CHECKED SHIPMENTS
I WON THIS IN THE PHILADELPHIA TENNIS CHAMPIONSHIPS !!
HE HAS PLAYED FOOTBALL, TENNIS, GOLF, CRICKET AND EVEN DONE FIGURE SKATING – WHAT'S MORE, HE HAS CUPS AND TROPHIES TO PROVE IT

ALEXANDER CUTHILL FERGUSSON

By

A. D. McFadyen

FOR more than fifty years Alexander Cuthill Fergusson has served the organization founded by his father in 1855—the Alex. C. Fergusson Company, of Philadelphia. When the clipper ship "Tonawanda" docked at Philadelphia November 12th, 1855—the senior Fergusson first put foot on American soil. Fergusson's passport indicated that he hailed from Ayr, Scotland, and that his purpose was to exploit his knowledge of chemicals, which in those days were mostly drugs.

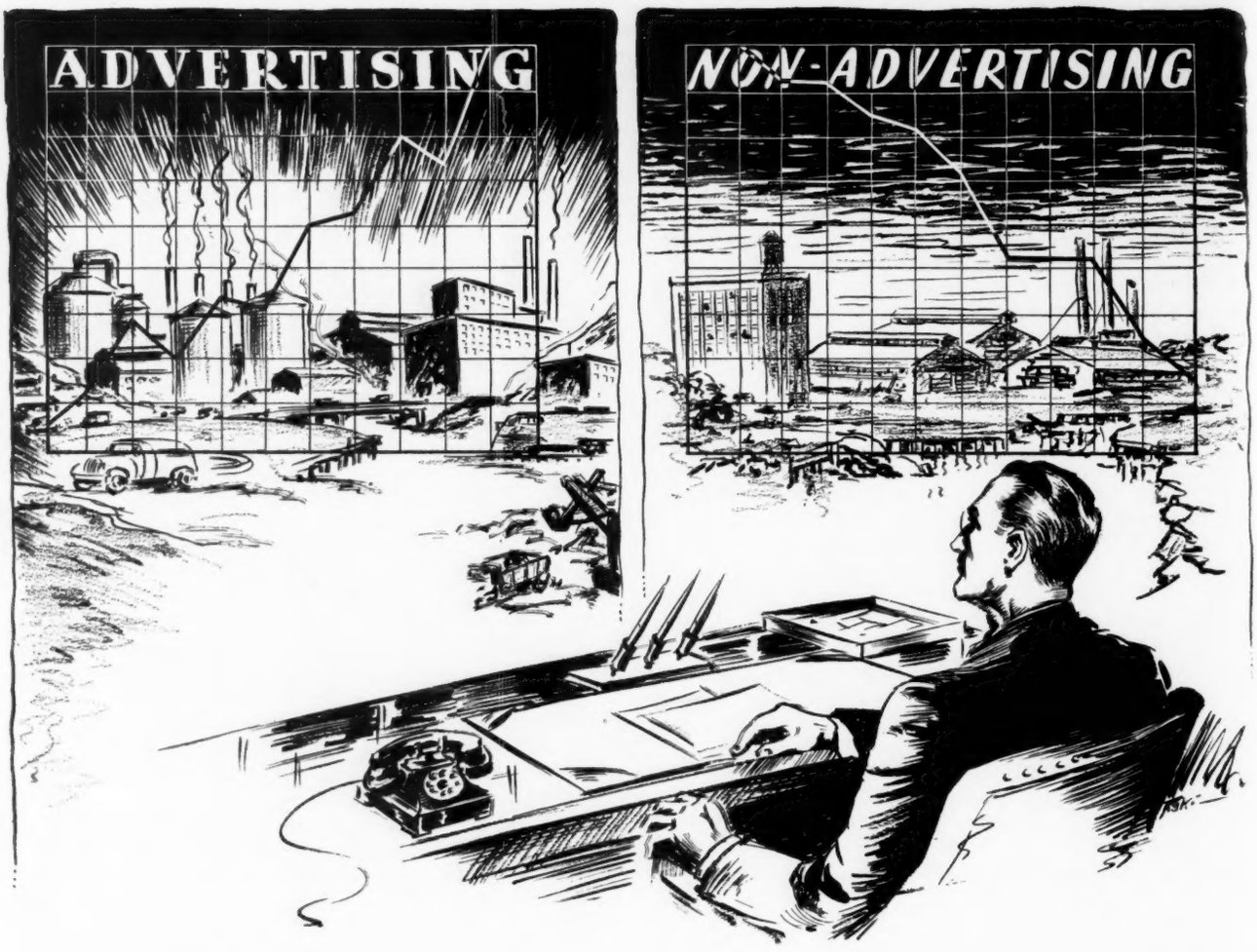
In the early days of the Fergusson organization, practically all chemicals were imported from England. This was particularly true of the alkalis, bleaching powder, and the chlorate of potash. In and about Philadelphia were located large soap, paper, glass, textile, and other industries, with consequent consumption of these basic materials. The Fergusson house, then located near Front and Chestnut Streets, represented a number of English manufacturers, receiving the imports and distributing the same to American consumers.

The present Fergusson arose to the helm not only the hard way, but through precise and strict discipline. As a captain in the First Regiment of the Grey Reserves, his father was considered Philadelphia's leading drill master during the Civil War. Under his precise and capable instruction, business rudiments and ethics were learned by the son, which have been carried down to the present time. The subject of the present sketch entered the employ of the House of Fergusson on the sixth day of February 1892. He began work for the princely pay of $3.50 per week, without the benefit of the 40-hour per week law. One of Fergusson's early duties was to visit the various wharves where shipments arrived, and apportion parcels of two or three hundred casks into smaller lots for reshipment. The contents of the casks varied, but somewhere on each cask was stenciled the numbers and the English weights in cwts., quarters, and pounds, both gross and net. It was 10 degrees below zero on a windy wharf that Fergusson began work, but he kept warm turning the 1200-pound casks around so he could read the weight marks.

In addition to handling the casks, young Fergusson was assigned various other duties, including responsibility of keeping the offices neat; copying the letters by hand, as well as serving as errand boy. When the telephone was installed at the Fergusson office (receiving the number 1411, in the consecutive order of installation), young Fergusson's legs were spared somewhat, but another outlet for his energy arrived in the form of a new-fangled typewriter. He learned typing by the hit and hunt system and soon became so proficient that he could write all the letters, both foreign and domestic, for the company, besides attending to shipping on the wharves and devoting a little time to calling on the drug trade of Philadelphia for orders. His success in the sales side of the business, and probably also memories of the gusts on the wharves, led Fergusson to devote all his time to sales. As the years passed, he largely relinquished outside sales promotion activity in favor of executive duties. At present his entire energy is devoted to manufacturing, procurement of materials, and financial problems presented by the current complex situation.

The Fergusson organization experienced the trying days of the War Between the States, then the Spanish-American War, World War I, and now is in the midst of World War II. During World War I the present Fergusson was at the helm. To satisfy a demand for red prussiate of potash urgently needed for blueprint work, Fergusson devised a system using an electrolytic process. For its practice a plant was constructed on a site once owned by Benjamin Franklin. During the same period Fergusson had charge of sales for the Calco Chemical Company in their newly begun dye stuffs and intermediate businesss. This interest led Fergusson to produce dye stuffs. In this connection, Fergusson was the first on the market with domestic fuchsine crystals, and Perkin type soluble blue. At one stage Fergusson had contracts with practically all the manufacturers of writing fluid. Fergusson was born in Philadelphia May 31, 1874 and was educated at Rittenhouse Academy. His mother was descended from Anthony Morris, Thomas Lloyd, and other prominent Philadelphians of colonial times. His great-great grandfather, Richard Hill, was head of the old United States Bank until it was abolished by the government in 1797. In his offices in the Drexel Building hangs an original water color, dated 1795, of the bank building which still stands on Third Street. As if to emphasize the continuity of the company name and spirit, Fergusson exhibits, with pardonable pride, a check dated September, 1863, drawn on one of the old Philadelphia banks in which his company still has an account; another memento is a receipted bill from the Internal Revenue Department for income tax paid by the senior Fergusson in 1865.

Aside from his business interests, Fergusson has been active in many fraternal and beneficent societies. He is a member of the Welcome Society, the Colonial Society of Pennsylvania, and the Order of Runnemede. He was a founder and past president of the Meridian Club; also of the Chemical Club of Philadelphia, and the Philadelphia Kiwanis Club. He is also a past president of the St. Andrews Society of Philadelphia, and following in his father's footsteps, joined *(Continued on page 539)*



WHY ADVERTISE

. . . *With Nothing to Sell?*

By C. H. Hazard, ***President***
Hazard Advertising Corporation

Now more than ever—says our author—must industry continue to advertise. Advertising is simply an instrument of education and that's one of the big jobs before us. Serious depression after the war may be averted by a cushion growing out of research and product improvement, preceded and accompanied by adequate preparation through advertising. Competition will follow war.

AN appreciation of advertising's role in industrial development admits of no question, however tentative, of a suspension of this force in the emergency with which industry is now preoccupied.

Now—more than ever—industry must advertise and it must continue to advertise right up to and beyond that happy day when peace prevails in the world and the industrial wars are resumed on a much larger scale and with greater intensity than we have ever seen.

When we talk of democratic institutions and the American way of life, we mean American industry . . . the greatest industrial machine the world has ever known. The enterprise, initiative and ingenuity of this great organization make our American way possible. These qualities will not permit of any cessation of activities which might set industry back. Progress is a traditional trait of American business. Retrogression and hesitancy have no part in its philosophy. America has an industrial culture to sustain; therefore an advertising program which is a prerequisite of large-scale industrial development must be maintained.

What Is Advertising?

Let us seek a truly enlightened view of what advertising is. Few really understand it. They accept it as a mysterious force playing on people's emotions, sometimes appealing to reason, but more often done because "it's the thing to do."

There is no mystery about advertising —no magic or occult influences which an intelligent person cannot understand. Advertising is simply an instrument of education. That is all. But when you let the significance of that simple fact penetrate your outside defenses and infiltrate into every nook and corner of your consciousness, you begin to realize that this process of education must go on in spite of hell, Hitler and high water.

What Are Salesmen?

What are salesmen but instructors in the quality, uses and merits inherent in the products they sell? Your products themselves perform this function, frequently with more articulate effectiveness than salesmen, advertising or any other medium you can employ. But when perforce they are withdrawn from the market and salesmen stop selling, is that a time to forego the only other educational medium left?

Wars come to an end eventually. They are usually followed by depressions. Out of depressions, and often while wars are raging, technological improvements, new ideas and inventions are born. This process of change—the improvement and development of new products, management and policy adjustments—is legitimate news of lively interest to many people. So a sound policy of education must continue.

There are hopeful signs that a serious depression may be averted or arrested after this war by a cushion growing out of research and product improvement, preceded and accompanied by adequate preparation through advertising. Then, too, as this forward-looking process develops, advertising will be imperative to insure an informed industry and public.

A highly competitive era is generally predicted to follow the war. The intensity of that competition can be greatly relieved by preparing for it in advance through advertising.

Interesting Story

There is an interesting, dramatic story about most businesses . . . a story, which, if known in all its colorful aspects to the many customers and prospects of the business, would make them more interested, feel more familiar, have greater confidence and a stronger urge to do business with the company, to know its products and their relation to their own problems and to everyday living. This is an excellent time to tell that story.

This is the kind of educational job some are reluctant to do at the sacrifice of more direct product selling when conditions are normal, although they admit its benefits if properly done. Ordinarily, time and space do not conveniently permit of much interpretation of company history, policy, ideals, facilities and such. Except by indirection, these features, which, after all, make the product possible, are neglected.

You may not now be in a position to make a direct or immediate bid for orders. You can, through education, keep those precious contacts, build goodwill and a background against the day when you will be seeking peacetime business again.

Competition will do it. You can be sure of that. And "competition" is used here in its broadest implications. For out of this nightmare will issue new competitors, new materials displacing old standbys, new processes dislodging old types of equipment and demanding new principles of engineering and production. Manufacturers are being *educated* to changes, the public is being introduced to new materials, technical innovations, and incidentally, a different standard of living.

Plan or Be Doomed!

Unless industrial management keys to this era of transition, prepares its customers and public with a complete understanding of how it has planned for the inevitable shifts in consumer requirements, it is doomed to disappointment, if not failure.

A product or company may be well known and highly regarded as a result of hard, patient cultivation over a very long period of time. Reputations are not made overnight. They are the reward of consistent effort involving all elements which condition people's minds, inspire confidence, create customer preference and demand.

This slow process, which has so amply demonstrated its effectiveness under normal conditions, can be equally effective even under the impact of war. The methods and techniques may change a little. They may have to be adjusted to the changed conditions but the fundamental principles remain the same. There can be no intermission or time out for normal business relations—war or no war. Business begins anew each day with fresh problems. There are new friends to be made, old friendships to be preserved. Memories are notoriously short; the average person is fickle. Industrial personnel changes, the advancement of men to positions of responsibility, technical changes—all affect the long-range policy of business. Any lapse or break in the contact, which should be constant, will prove costly. Selling, albeit of a more subtle character must go on.

New Vice-President

Companies with a large stake in the future might do well to create an entirely new office—that of Vice President in Charge of Public Relations . . . an official whose sole responsibility would be to prepare with meticulous care and thoroughness the background against which business can return to its normal status after the war. The average executive now is so absorbed with today's pressing problems that he has little time to think about much less prepare, for the future—certainly not time for the concentrated study and planning the situation demands. A Vice President in Charge of Public Relations will make no concessions to present operations, except as they may affect the company's future welfare.

Consolidate Position Now

Any company which aspires to a high place in the post-war years will consolidate its position now, prepare its first lines of offense and supporting forces for the unpredictable future—unpredictable as to detail but definite enough in the general pattern of greatly increased manufacturing capacities an enlarged army of trained labor, depleted inventories, exhausted and worn-out machinery, new materials, higher standards, closer tolerances, increased speeds—all of which will inevitably result in extremely vigorous competitive clashes. The severity of this scramble for business after the emergency can be anticipated and the shocks springing from readjustment and the return to normal business pursuits can be absorbed in advance by intelligent, consistent advertising.

There is no other way that this objective can be accomplished at comparable cost and with equal assurance of success.

BETWEEN THE LINES

The magic, behind-the-scenes story of explosives is told in this brisk instalment.

THE public may see little relationship between the series of seemingly disconnected allocation, restricting, or production moves in various obscure chemical elements, and the measure of the American war effort. Nevertheless, it is there, in these orders now coming with increasing frequency, and urgency, from the War Production Board and other sources.

The real measure of a nation's war effort, as spelled by its potentialities for damaging an opponent, is smokeless powder, according to recognized military authority. The amount of powder available eventually influences the amount of shooting that can be done. In the first World War American forces in France and at sea shot up 330,000,000 pounds.

The rate today is certain to be much higher, both in rapidity of consumption of powder stocks, and in volume. Air war is an important factor in this—there may not be as many 1-ton and 2-ton bombs made as there are 3-inch or other-calibred shells, but these bombs, and other sizes of bombs, take lots of explosives. If the United States carries through its present plans for aerial attack on enemy forces, in the Pacific and elsewhere, the number of bombs must be almost unlimited.

Airplanes in World War the First generally fired one, or at best, two machine guns. Today's planes fire 6, 8, and 12 machine guns, of which perhaps half in each plane will be approximately half-an-inch in calibre. Numerically and in amount of explosives required for each shot, airplanes in today's war will use an infinitely larger amount of smokeless powder, and for aerial cannons, coming into general use now, other explosives, in addition to what is contained in the bombs slung underneath.

Explosives therefore, today constitute an even more critical measure of potential war capacity than ever before. There should be no surprise that a major contribution of the chemical industry is in this field, accordingly. Specifically, there are now under construction, or coming into operation, some 350 chemical plants whose prime mission will be production of explosives for the American war effort this year and afterward. Of this number perhaps a third will be concerned primarily with furnishing the raw materials for producing finished explosives.

In short, the United States has had to build, almost from the ground, a war explosives industry. This will seem strange to the average American, who knows this country industrially uses quantities of explosives, and whose people in large numbers, are accustomed to use of sporting weapons. The fact is, and those in the chemical industry are more aware of it than the layman, that peace-time explosives and those for war are two different matters. In some categories the two do not even require the same raw materials. Furthermore, production methods differ.

For normal use the ordinary explosives most in demand are black powder and nitroglycerine, and some detonating agents, fulminate of mercury, as a rule. For war, smokeless powder, TNT, combinations of explosive force which are the guarded secrets of the Government, are needed.

Caught Short

Despite the number of cartridge manufacturing plants, the du Ponts, or other plants, in this country, war found us with virtually no facilities for producing war-type of explosives on the scale indicated. For most of the past two years, accordingly, the Government has been frantically setting up plants to meet this shortage, and latterly, in imposing on various hitherto unsuspecting industries, the rigorous curtailments in their own supplies, that these munitions plants may have the stuff on which to chew.

A generalized summary of the principal components entering war munitions is a key therefore, not only to the orders now being issued, or which have been issued, but is a more technical index to the dimensions of the war effort now contemplated, or becoming operative.

Alcohol has been dealt with here in another issue. It enters into smokeless powder, of course, but it also combines to make detonating agents. It augments the sensitivity and explosive force of the inside bursting charge of explosive shells of various types, bombs, etc. Combined with mercury, it forms fulminate of mercury. Recalling that the present total amount of alcohol which it is anticipated will be required annually for war now is about 300,000,000 gallons, it is interesting to note that in the first World War, 183,-500,000 pounds, to use a different unit of calculation, went into production of fulminate of mercury.

There are four main types of explosives for combat use—propellants, in which is included smokeless powder, and in the case of our British associates, cordite, to send the projective from the gun; high explosives, contained inside many types of projectiles, large and small, for bursting the metal shell and increasing the havoc of the hit; demolition charges, and detonating.

Smokeless powder is compounded of cellulose and nitric acid. Branching in another direction the combination also would result eventually in the plastics that in peace make toilet articles, or rayon. The cellulose is produced from cotton linters, the short fibres adhering to the cotton seed after ginning. It is also made from wood pulp.

Pausing at this stage the reader will doubtless think at once of some of the WPB or other Government restrictions that he can connect with the processes indicated—the alcohol order, the molasses order, those governing war-time uses of rayon, nylon, wood pulp, cotton linters.

Cotton linters enter rayon manufacture, as does wood pulp, and one or the other makes cellophane, and white paper. Orders will be recalled here on cellophane and on ingredients of white paper.

The linters are treated with nitric acid, then resulting pyrecellulose, or guncotton, as it is colloquially termed is treated with a mixture of alcohol and ether, or wood pulp may be used to replace the linters. A quantity of wood pulp is expected to be thus used, in fact.

Need Nitric Acid

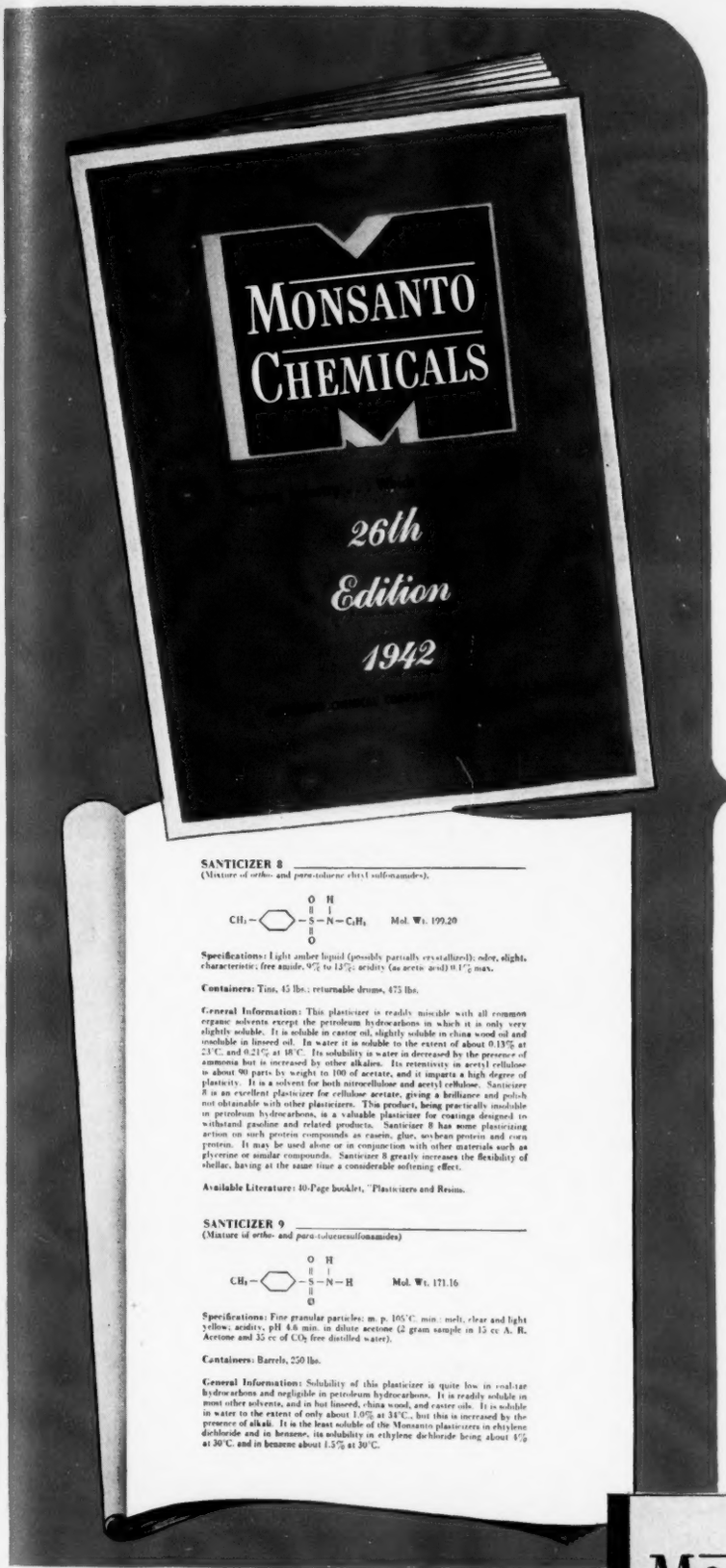
Nitric acid, as chemical engineers know, is a powerful acid. It is derived of hydrogen and oxygen, and nitrogen. The latter is an important element of fertilizer. There are WPB orders on that. One part hydrogen, one of nitrogen, and three of oxygen sums up the combination of an extremely reactive chemical. Commonly nitrogen and hydrogen are combined to produce ammonia, and addition of oxygen and water make the acid.

Another method also in use is extraction of nitric acid from Chilean nitrate, using sulfuric acid. Meanwhile the guncotton, with alcohol and ether, make a jelly-type mass, which can eventually be formed into grains of the desired shape and size. Drying expels the ether and alcohol, the resulting product being almost pure guncotton. It is possible to recover about 65 per cent. of solvent, about half as much of alcohol as ether.

Cellulose and nitric acid combine in the presence of sulfuric acid to form cellulose nitrate, the basic smokeless powder component. However, it is necessary to purify this combination to preclude a rapid deterioration that leads to premature explosion. Industrial alcohol is the purifying agent here.

In passing, one of the most exacting duties aboard naval vessels is the care and understanding of the powder carried in the magazines. This propellant is largely furnished in silk bags. When a Congressman, or some other layman glibly demands that the Navy begin to build ships carry-

(*Continued on Page 535*)


MONSANTO
CHEMICALS
26th
Edition
1942
SANTICIZER 8
(Mixture of ortho- and para-toluene ethyl sulfonamides).
Mol. Wt. 199.20
Specifications: Light amber liquid (possibly partially crystallized); odor, slight, characteristic; free amide, 9% to 13%; acidity (as acetic acid) 0.1% max.
Containers: Tins, 45 lbs.; returnable drums, 475 lbs.
General Information: This plasticizer is readily miscible with all common organic solvents except the petroleum hydrocarbons in which it is only very slightly soluble. It is soluble in castor oil, slightly soluble in china wood oil and insoluble in linseed oil. In water it is soluble to the extent of about 0.13% at 25°C. and 0.21% at 18°C. Its solubility in water in decreased by the presence of ammonia but is increased by other alkalies. Its retentivity in acetyl cellulose is about 90 parts by weight to 100 of acetate, and it imparts a high degree of plasticity. It is a solvent for both nitrocellulose and acetyl cellulose. Santicizer 8 is an excellent plasticizer for cellulose acetate, giving a brilliance and polish not obtainable with other plasticizers. This product, being practically insoluble in petroleum hydrocarbons, is a valuable plasticizer for coatings designed to withstand gasoline and related products. Santicizer 8 has some plasticizing action on such protein compounds as casein, glue, soybean protein and corn protein. It may be used alone or in conjunction with other materials such as glycerine or similar compounds. Santicizer 8 greatly increases the flexibility of shellac, having at the same time a considerable softening effect.
Available Literature: 40-Page booklet, "Plasticizers and Resins.
SANTICIZER 9
(Mixture of ortho- and para-toluenesulfonamides)
Mol. Wt. 171.16
Specifications: Fine granular particles; m. p. 105°C. min.; melt, clear and light yellow; acidity, pH 4.6 min. in dilute acetone (2 gram sample in 15 cc A. R. Acetone and 35 cc of CO_2 free distilled water).
Containers: Barrels, 250 lbs.
General Information: Solubility of this plasticizer is quite low in coal-tar hydrocarbons and negligible in petroleum hydrocarbons. It is readily soluble in most other solvents, and in hot linseed, china wood, and castor oils. It is soluble in water to the extent of only about 1.0% at 34°C., but this is increased by the presence of alkali. It is the least soluble of the Monsanto plasticizers in ethylene dichloride and in benzene, its solubility in ethylene dichloride being about 1% at 30°C. and in benzene about 1.5% at 30°C.

HOW TO FIND WHAT YOU WANT — WHEN YOU WANT IT

HERE is information on Monsanto's complete line of products arranged in handy, ready-reference form to save you time and trouble in finding exactly the right material for your needs.

In this 160-page new edition of the Monsanto products book, you will find structural formulas, accurate descriptions of physical and chemical characteristics and brief data on uses that will often tell you at a glance whether or not a specific material has promise of meeting your needs. You will also find information on containers and shipping classifications and a reference to any additional Monsanto literature that may be available.

If you would like to have this time and trouble-saving information at *your* fingertips, write today on your business letterhead for a copy of the 26th edition of "Monsanto Chemicals." MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Montreal.

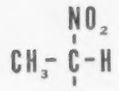
"E" for Excellence...the pennant denoting the highest service accomplishments in the United States Navy...flies with the Naval Ordnance flag over Monsanto. In the words of the Secretary of the Navy, this award has been made to Monsanto "in recognition of your outstanding efforts in the production of ordnance materiel vital to our national defense."

MONSANTO CHEMICALS

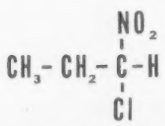
SERVING INDUSTRY...WHICH SERVES MANKIND

THESE 5 NEW CHEMICALS

(THE CHLORONITROPARAFFINS)



1-CHLORO-1-NITROETHANE



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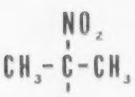

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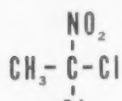
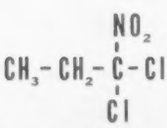


1,1-DICHLORO-1-NITROETHANE



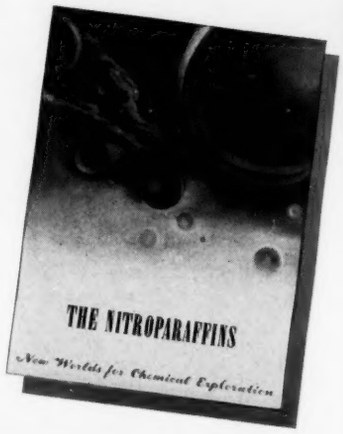
1,1-DICHLORO-1-NITROPROPANE

. . . will help you solve Tomorrow's problems Today

We present 5 new Nitroparaffin Derivatives. To your chemists, they may suggest an important process improvement or aid in developing an entirely new product . . . solving *tomorrow's* problem *today*.

Industrial fumigants, anti-gelling agents for rubber cements, starting points for synthesizing other new compounds — these are some applications which have come to light in the short time the Chloronitroparaffins have been available. Undoubtedly their most important uses are yet to be discovered.

Samples for laboratory investigations will be supplied upon request. We will be glad to work with you on any problems involving these compounds.



This new Data Book on the Nitroparaffins and their Derivatives will gladly be sent on request.

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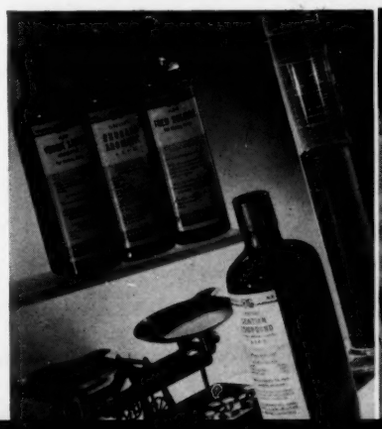
Plants: Terre Haute, Ind. • Peoria, Ill. • Agnew, Calif. • Harvey, La. • Westwego, La.

11th Annual All-America Package Competition Winners

Modern Packaging Magazine has announced the award winners in its recent 11th Annual All-America Package Competition. These representatives are from the chemical, drug and allied industry groups.

Upper left, top award in Oils, Paints and Varnishes class went to Shell Oil Co. for this redesigning job. Upper right, top award in Canadian group went to Canadian Oil Companies Ltd. for this family group. Center left, Upjohn Co. won the window display classification. Center right, Sharpe & Dohme, Inc. took top award in Drugs, Chemicals and Drug Sundries class with these human blood plasma packages.

Lower group. Left, "Spasaver" bottles of Sharpe & Dohme which won a top award. Center, Sears Approved Drugs won a top award. Right, Top award in Oils, Paints and Varnish class went to General Vault Products Co.



Headliners in the News

1

(1) American Section of the Society of Chemical Industry met jointly with the American Institute of Chemical Engineers, March 27, at the Chemists' Club, N. Y. City. Subject of the evening was "Vitamins." Dr. Lela Booher (left), of the Milwaukee Children's Hospital, spoke on "Chemistry and Nutrition of the Vitamins." Dr. Randolph T. Major (right), director of research, Merck & Co., Inc., was the other speaker of the evening. His topic was "Synthetic Vitamins, a New American Industry," and was given by Dr. Major in the absence of George Merck, president of the company, who was unable to attend. Dr. Lincoln T. Work presided.

2

(2) Louis A. Hoffman has been elected president and general manager of the Hilton-Davis Chemical Co., Cincinnati, succeeding A. B. Davis, who died March 11. (3) J. B. Wiesel, director of sales of the Cellulose Products Department of Hercules Powder Co., has been appointed advisor to J. B. Davis, chief of the Protective and Technical Coating Section of the WPB. He will have charge of the allocation of nitrocellulose and ethyl cellulose. (4) R. B. Tucker, director of glass sales of the Pittsburgh Plate Glass Co., has been elected to the board of directors of the company succeeding H. A. Galt.

3

(5) Pictured in a lighter moment during their testimony before the Truman Senate committee are W. S. Farish, left, president of the Standard Oil Co. of N. J., and F. A. Howard, vice-president of the firm, right. They presented the company's answer to government charges that Standard Oil retarded development of synthetic rubber in this country through its cartel agreements with I. G. Farben of Germany.

4

5

. . . Do you realize how many man-hours of research are spent in the constant improvement of N. Y. Q. products?

Hour after hour—day after day—month after month—research is being carried on in the laboratories of N.Y.Q. for the improvement of our products — to assure highest quality and to control manufacture from raw materials into finished substances. That is why so many satisfied customers have confidence in products carrying the N.Y.Q. label.

The NYQ label carries with it sixty-seven years of experience.

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Iodoform
Potassium Iodide (*Cryst.-Gran.-Powd.*)
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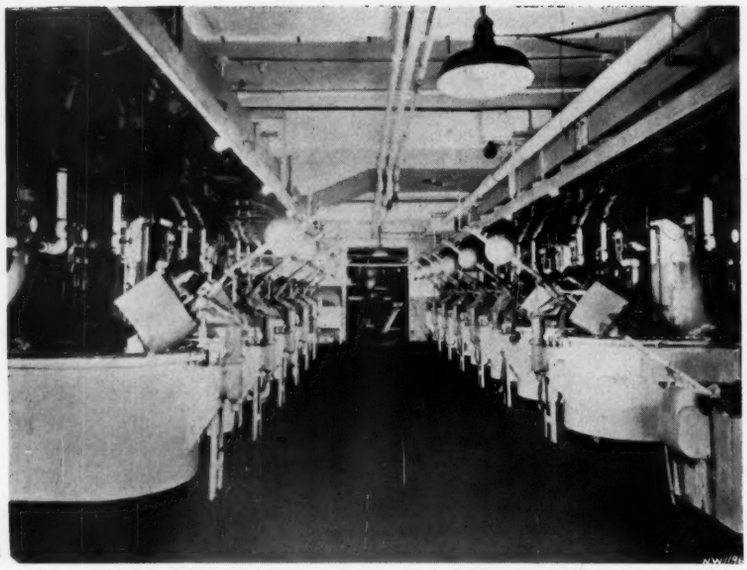
1



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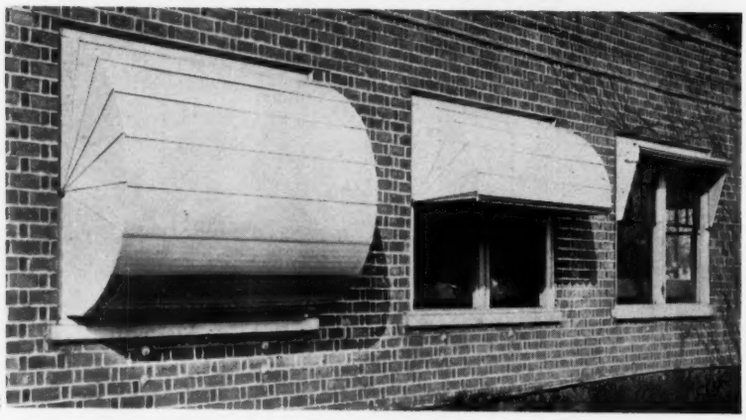

3

Here & There in the Chemical Industries

(1) New York Chapter of the Illinois Institute of Technology held its first annual dinner at the Chemists' Club, N. Y. City, March 11. Henry T. Heald, president of the Institute, spoke on the vital role played by engineering schools in training men to speed up war production. Harold Vagtborg, director of Armour Research Foundation, also spoke on the need for research in the world today. (2) Copper plating thickness is controlled at Westinghouse Newark works by using watt-hour meters to control the current to these electroplating tanks. (3) New practical answer to the blackout problem for industrial use—"Meta-Fold" metal blackout awnings designed and manufactured by the Acklin Stamping Co., Toledo, O. (4) Magnus, Mabee & Reynard, Inc., N. Y. City, was host to more than 300 guests at the company's annual dinner to Druggists Supply Corp. members and affiliated manufacturers March 8 at the Hotel Astor, N. Y. City.

4

MONOANILIDO PHOSPHORUS OXYCHLORIDE
Physical state: Gray, crystalline solid.
Melting point: Softens at 64° C. Melts between 70 and 80° C.
Solubility: Soluble in ethyl ether, acetone, ethyl acetate, ethylene chloride, chloroform, chlorobenzene, and benzene. Sparingly soluble in carbon tetrachloride and petroleum ether.
Reactivity: Decomposed by water. Reacts with alcohols, phenols, and amines.
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Literally hundreds of these "phosphates for the future" . . . waiting for an opportunity to serve in modern industry. During recent years many unusual phosphorus compounds have been produced by Victor's research chemists. Each has been carefully studied . . . its specific properties determined, recorded and filed for the future.

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- Calcium Phosphates
- Magnesium Phosphates
- Potassium Phosphates
- Sodium Phosphates
- Sodium Pyrophosphates
- Potassium Pyrophosphate
- Alkyl Acid Pyrophosphates
- Formic Acid
- Aluminum Formate
- Nickel Formate
- Sodium Formate
- Sodium Boroformate
- Oxalic Acid
- Calcium Oxalate
- Sodium Oxalate
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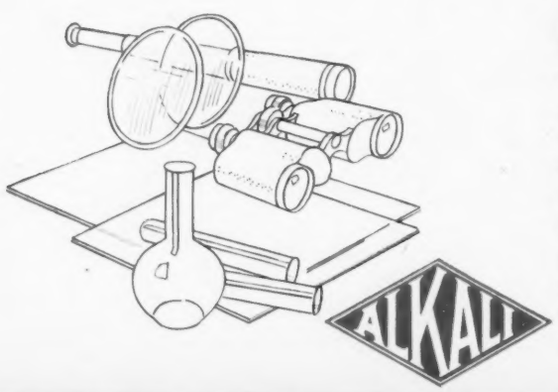

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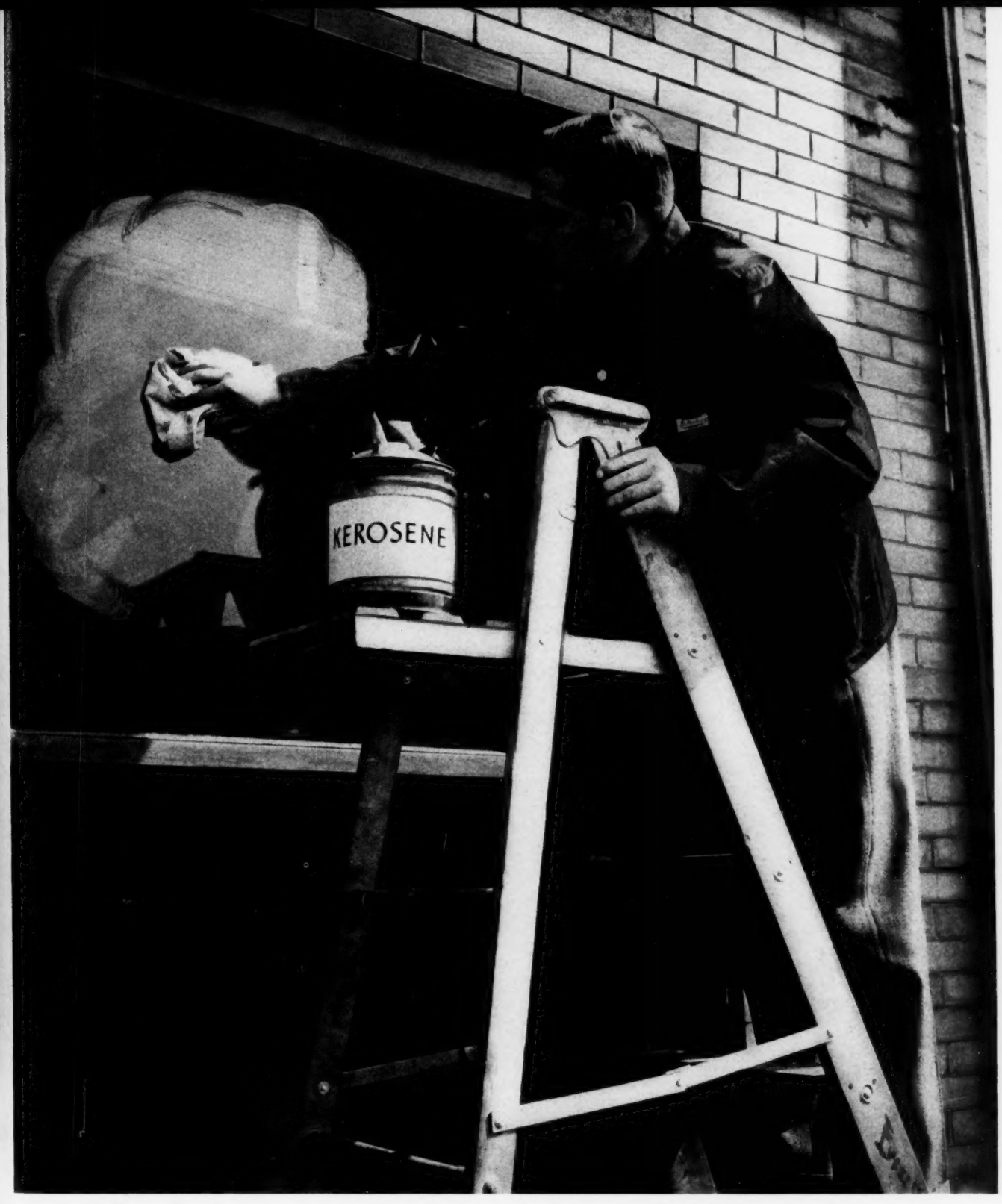

CHEMICAL SPECIALTIES

An outside blackout coating which can be sprayed or brushed on windows forming a dense, black coating impervious to all weather conditions. Offered by Douglas Distributors, Inc., N. Y. City, it is known as Protex-Rowe No. 200 Outside Blackout Coating. Approved by OCD and Bureau of Standards, it dries in a half-hour and is removed with kerosene rag.

Industrial Agricultural Household

SHOE POLISHES

and CLEANERS

By C. T. Small, Ph.D.

Here's a phase of the chemical specialty business about which little, if anything, has been written. It's in answer to all your questions about the preparation and production of shoe polishes and cleaners. Incidentally, the War Department is working on specifications for a solvent-type paste which this article describes in detail. Formulas of typical commercial products are included.

SHOE polish, like cosmetics, undoubtedly has a part in keeping up the morale of the nation. Even in periods of war time, good appearance has been proved worth the effort it costs. We surmise that many of the young men in the service are learning habits of neatness never acquired before.

Of the many types of shoe polishes and shoe cleaners, the one most commonly used is paste wax in black or brown, since this meets a very general need. Such a polish should have certain characteristics in order to be highly salable. It should spread easily when rubbed on the shoe with a brush or a piece of flannel; it should form a thin smooth layer free from lumps; it should buff up readily, giving a reasonably high polish without a great deal of rubbing; and it should be economical in use, a little going a long way. Ordinarily the user also wants a polish that will darken the leather—one which contains enough dye to darken scuff marks on either brown or black shoes.

Ingredients

The basis of such products is a wax mixture, no one wax being suitable. The hard wax most used because of highly satisfactory results is carnauba, which melts at about 183-186° F. The melting point of a wax appears to be directly related to its hardness. The melting point of carnauba is unusually high. At present this wax is very expensive, being pegged at about 84 cents a pound for Yellow No. 3 North Country. Since this is a South American product, uncertain shipping conditions and the shortage of ships account for the scarcity and resulting high price of the wax.

Another South American wax—also very hard—is ouricuri, which comes from a different part of Brazil. This is a relatively new product which started coming into this country in small lots some four or five years ago. Ouricuri (also spelled uricury) wax, American refined—which means refined after importation—melts at about 182° F. The price quoted is about 60 cents a pound, but this wax, like carnauba, is now hard to get. The wax is not as clean as carnauba even when refined, but it is suitable to replace carnauba in paste shoe polish, although of different composition.

Candelilla wax, a Mexican product, is also classed as a hard wax and has often been used to supplement and sometmes to replace carnauba wax. Candelilla wax melts at 152-154° F., is not as hard as carnauba, but is much less expensive; quotations are about 33 cents a pound.

Combined with one or more of these is a soft wax such as beeswax, melting at 145-148° F. This is fairly expensive, (about 55 cents a pound for a refined yellow grade). A mineral wax, now domestic,—ceresin—is sold in different melting points. A grade melting at 138-140° F. is quoted at 14 cents a pound; one melting at 150-160° F. at 17 cents a pound. Ceresin has sometimes been adulterated with paraffin, which would give the lower melting range and would naturally be expected to lower the price, since paraffin is a very inexpensive hydrocarbon with wax-like properties. Fully refined paraffin melting at 138-140° F. sells for seven to eight cents a pound. Ceresin, if used, should be purchased on the basis of its melting point. If this is no higher than that of paraffin, the latter is to be preferred. Paraffin is often present in shoe polish as a softening agent blended with a hard wax, and is highly suitable for this purpose.

Reason for Combination

A real reason exists for combining more than one wax in a paste polish. While a hard wax like carnauba is no doubt the one which gives the product its good polishing properties, such a wax by itself would be brainy and would not be in a good physical form for spreading. Blended in suitable proportions with a soft wax, this undesirable property is overcome and a smooth pomade-like paste obtained. When spread on the shoe, the wax should give a very thin but coherent and lasting coating, a result achieved by incorporating a suitable proportion of carnauba or ouricuri in the wax mixture.

These waxes are not merely melted and mixed together. They are also dispersed in a suitable medium in which they will be at least partially soluble. Turpentine has been much used for the purpose because of its high solvent power for waxes, but it is a fairly expensive solvent, costing 65-80 cents a gallon. Nitrobenzene has also been much used in shoe polish for its solvent properties, perhaps also for its odor. This odor is so commonly associated with shoe polish that people expect all shoe polish to smell of nitrobenzene. However, this chemical is highly toxic so that it is banned by law in some regions in products for household use. Materials which may be incorporated to give an odor somewhat like that of nitrobenzene are trichlorobenzene and ortho-dichlorobenzene. About one-half of one per cent. is a suitable amount of either of these.

The quantity of dye to be used depends on whether the maker wishes to color his polish or wishes the polish to color the shoe. Some products contain only enough dye to give a colored paste so that the product is in fact a "neutral" polish suitable for use on any color of shoe. When spread on paper or on leather this polish leaves substantially no color after rubbing. For the type which is to color scuff marks on leather, the polish should contain 1-3 of one per cent. of dye, depending on the kind. A dye much used in black polish because fairly satisfactory and very inexpensive, is oil-soluble nigrosine base or

a nigrosine derivative. Other black dyes are also used.

The idea of using carbon black has probably occurred to more than one investigator, as one would think this should have good covering power on scuff marks. However on trial, carbon black in shoe polish has been found to have an adverse effect on the physical nature of the product. Instead of being smooth and waxy, it is amorphous, grainy and somewhat crumbly even with a small proportion of carbon black in the mix, so that carbon black definitely has to be excluded from consideration.

Brown colors are usually a mixture, such as that of red, yellow, and black oil-soluble dyes, several combinations being possible according to the depth of color desired. A single brown dye has not usually proved satisfactory.

Examples of formulas for products rather high in wax content are the following:

Carnauba wax, Yellow No. 3 N. C.	12%	Carnauba wax, Yellow No. 3 N. C.	8%
Beeswax	8	Beeswax	8
Ceresin	12	Paraffin	14
Turpentine	68	Turpentine	70
Dye to suit		Dye to suit	

The same formulas can be used for either black or brown, only the dye added being different. Ouricuri wax, which can be substituted for carnauba, does not appear in any of these formulas of commercial products because of its relatively recent introduction into this country.

Possibly more typical are the following approximate formulas of commercial products:

Carnauba wax	10%	Carnauba or candelilla wax	20%
Beeswax	10	Beeswax	5
Turpentine	80	Turpentine	75
Dye to suit		Dye to suit	

Instead of turpentine alone, many polishes are made with a mixture of solvents such as turpentine and kerosene or a turpentine substitute and another organic liquid. These other liquids, petroleum fractions, are very much cheaper than turpentine. Stoddard's Solvent which is often used, costs 10-14 cents a gallon, kerosene about six cents a gallon. One of the advantages of turpentine is its relatively low boiling point. Turpentine boils at 310-319° F. Petroleum solvents, being mixtures of hydrocarbons, boil over fairly wide ranges; Stoddard's Solvent, which is much the same as dry-cleaners' naphtha, boils at 300-410° F., kerosene at 350-416° F. The lower the end boiling point, the more rapidly the solvent will evaporate, a property desirable in the application of shoe polish so that drying will be rapid and the buffing accomplished quickly.

Another point to be considered in choosing hydrocarbon liquids is the flash point. Many municipalities have strict ordinances regarding the storage and use of inflammable liquids. For example in New York City a liquid is not classed as inflammable if it has a flash point over 100° F., although it may be termed combustible. Such liquids may be used under certain regulations. Stoddard's Solvent meets this requirement; so does kerosene, which has a flash point of about 130° F. This classification of liquids as "not inflammable" but "combustible" is a distinction characteristic of New York City fire regulations, —doubtless adopted in many other large cities. The original purpose was to enforce the use of liquids in dry-cleaning establishments which would be safer in use than ordinary naphtha with a much lower flash point.

Examples of polishes containing a mixture of solvents are the following:

Carnauba wax, Yellow No. 3 N. C.	22%	Carnauba wax, Yellow No. 3 N. C.	5%
Paraffin	10	Candelilla wax	5
Turpentine	50	Beeswax	5
Kerosene	18	Paraffin	10
Dye to suit		Turpentine	10
		Stoddard's Solvent	65
		Dye to suit	

This first formula is high in carnauba wax and in total-solids content. The problem,—easy to state but not so easy to solve,—is to produce the desired texture of paste with a minimum amount of wax and a maximum amount of solvent, since wax is expensive and solvent cheap. If too high a proportion of solvent is present, the product will bleed; if too high a proportion of solid, the producer will probably go broke. Over 30 per cent. of solids is high from the point of view of possible profits.

Method of Preparation

In making these preparations, the waxes are first melted together. Refined grades which must be used as crude waxes always contain varying amounts of dirt, part of which would settle out when the waxes are melted, but part of which would remain in fine suspension in the wax mixture to give a thoroughly unsatisfactory product. The temperature should be kept as low as possible, not only to conserve steam, but to speed up the process so that the solvents can be added as soon as the waxes are melted and mixed. The kettle used is preferably equipped with an automatic mixer, as thorough mixing is absolutely necessary. Melting and mixing of the waxes can be accomplished at 190° F. As soon as the molten waxes are well mixed the heat is turned off and the solvents added with rapid stirring. Odorants and dyes are then added as soon as the solvent-wax mix appears to be homogeneous, and the rapid stirring continued so that the mix will cool as quickly as possible. Refrigeration is often employed to hasten cooling and insure proper setting.

Rapid cooling makes the product smooth and prevents granules from forming. Shortly before the mixture is ready to congeal it is drawn off into containers and allowed to solidify uncovered. The temperature at which it should be drawn off will probably be about 125° F., but this can be determined for the individual mix by experiment,—by determining the approximate solidifying point of samples withdrawn from the batch, and filling the containers from the batch at a temperature safely above this. As soon as the paste has solidified so that it will not be disturbed by handling, the covers should be fitted on tightly to prevent further evaporation of solvent.

The room in which the process is carried out must be well ventilated because of the escape of fumes during the mixing and congealing of the polish. It must also be remembered that although the petroleum solvents referred to here are not classed as inflammable, their hot vapors are combustible and due caution must be exercised to prevent a flame or spark coming near them.

Containers

These paste wax polishes have commonly been packed in flat round cans with lithographed labelling on the metal. Some are plain friction-top to be pried open; some have a small lever attached to the lower half which turns to force off the cover. The capacity varies from 1½ to 2 ounces, some well-known brands being sold in 1⅝ ounce cans. One of the large can companies reports that their cans are now being enamelled instead of tin-plated, but that at present they are filling orders only for regular customers who have prevously made their purchases from them. If suitable cans are not readily available it is possible that a product such as paste shoe polish can be packed in plain jars of heavy glass fitted with screw tops of the type made for the less expensive cold creams. These may be expected to cost in the neighborhood of $3.25 a gross for 2-ounce jars, a price not out of line with the cost of cans.

While there are no government specifications for shoe polish for the Army or Navy, a recent communication from the War Department stated that "the subject of shoe polish is now under consideration by the Bureau of Standards, and specifications are being developed for solvent-type shoe paste."[1] This refers to the type of polish discussed above.

Cream Polishes

Cream polishes may be semi-liquid but more often are smooth, rather thin pastes. This physical form has been popular for the neutral polishes intended to serve as a cleaner and polish for reptile-skin shoes

[1] Private communication dated Feb. 19, 1942.

The cream polishes may be considered modifications of the wax pastes because they also contain waxes and solvents. Most used emulsifying agent is soap.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

and odd colors such as the red, green and blue-dyed leathers in ladies' shoes. These products are usually cream-colored as well as creamy in consistency.

The cream polishes may be considered modifications of the wax pastes inasmuch as they also contain waxes and organic solvents. In addition they contain water, which, mixed with an immiscible solvent and wax, requires the presence of an emulsifying agent to give a homogeneous emulsion. The emulsifying agent most used is soap. The following formulas serve as illustrations:

Carnauba wax	6%	Carnauba wax	10%
Paraffin	4	Beeswax	3
Soda soap	5	Paraffin	10
Turpentine	15	Potash soap	3
Water	70	Turpentine	15
		Stoddard's Solvent	12
		Water	47

The first of these is thinner than the second because of its low wax-high liquid ratio. To make these, the waxes are melted and stirred together and the organic solvents added with stirring. The water is brought to boiling in a separate kettle, the soap dissolved in this and the wax-solvent mixture poured into the boiling water. This is stirred until nearly ready to set, when it is run into containers.

Neutral cream pastes have in the past been packed mostly in collapsible tin tubes. Collapsible tubes of tin-coated lead are being made, thus reducing the amount of tin used, but whether they will be available for these particular products is another question. Terne metal—a high lead, low tin alloy—is also made into collapsible tubes. With the increasing scarcity of metals for civilian use, even lead, the future availability of these containers is highly questionable. One method of getting around this type of packing would be to reduce the proportion of waxes so that a liquid emulsion would result which could be put up in bottles, a type of product made formerly but more or less displaced by creams. A proportion of 5-10 per cent. of total solids would no doubt produce a liquid. In practice one would merely add more water, and if necessary, more emulsifying agent. Soda soap tends to set to a gel, thus itself having a thickening action,—in the presence of soda soap some products have been found to retain their proper consistency for months and then set to a solid gel. Potash soap is a liquid and is preferable to soda soap when a liquid product is desired.

The liquid shoe polish of a generation ago consisted for the most part of a simple solution of shellac in alcohol or in ammonia or borax solution, with a suitable dye added. The presence of the dye and the lower proportion of shellac were the main differences of this from floor shellac. The liquid was put up in a bottle with a dauber affixed to the stopper so that all one had to do was to pull out the stopper and rub the dauber wet with the liquid over the shoe. This was easy and quick to use and required no rubbing up. One trouble with it was that it tended not to stick to the leather well enough.

The modern successor to this having the same properties of easy application and requiring no buffing is essentially similar to self polishing floor wax. It is an aqueous emulsion containing no organic solvent, but wax emulsified directly in water Manufacturers of water-base waxes can very easily add shoe polish to their line by suitable modifications of their formulas, with incorporation of brown or black dyes. Nigrosine is the dye most commonly used for black, being inexpensive and water-soluble.

In water-base polishes containing no organic solvent a soft wax is neither necessary nor desirable, carnauba wax alone serving as the actual polishing agent. A small amount of resin or shellac is often present to enhance the self-polishing properties of the product. Soap is the common emulsifying agent, several types being used. Ordinary soda tallow soap has the disadvantage of tending to make the product gel on standing. Examples of formulas follow:

Carnauba wax	10%	Carnauba wax	10%
Soda-rosin soap	2	Triethanolamine oleate soap	7
Shellac or other resin	1	Ammonia water	1.5
Dye	1	Iron oxide pigment	14
Water	86	Brown dye	0.5
		Water	67

A brown dye can be made from three parts of water-soluble brown dye, four parts of water-soluble black dye, and three parts of potassium dichromate. In the second formula iron oxide pigment is used to intensify the brown color. When shellac is used it must be dissolved separately in water made slightly alkaline.

Method of Preparation

Frequently the soap is made in the product. The wax is melted and mixed with the rosin, oleic acid or other fatty acid from which the soap is to be made. The calculated amount of alkali-caustic soda of triethanolamine in the above, in concentrated aqueous solution, is added with stirring, and boiling continued until saponification is complete. Boiling water is next stirred in, then the dye, previously dissolved in water. Shellac is warmed in an alkaline solution of borax, ammonia, or trisodium phosphate, and added to the emulsion after both have cooled down. The water used for the shellac should be deducted from the total. The pigment in the second formula should be sifted into the saponified emulsion with rapid stirring before the balance of the water is added. As in making paste waxes, the product is cooled as quickly as possible since this aids in producing a smooth emulsion.

A parallel exists between water-resistant floor wax and water-proof shoe polish. The first water-base floor waxes were made with soda soap as emulsifying agent. This was deposited on the floor along with the wax, but being water-soluble, when the floor became wet the soap tended to dissolve, and soften or partially re-emulsify the wax. In order to make such a surface film more durable and more resistant to tracking in of water, other types of soap were introduced into the wax, ammonia soap being the first to produce water-proofness. This was because the ammonia soap decomposed during evaporation, the ammonia formed being dispersed in the atmosphere in the vapor state, leaving behind the other component of the soap, water-insoluble fatty acid. Triethanolamine behaves somewhat similarly but its soap decomposes more slowly. Triethanolamine, being less volatile than ammonia, is easier to handle during manufacture, but is much more expensive than ammonia. Monoethanolamine soap is also used.

In the same way, the ammonia and the amine soaps can be applied in shoe polish to give a water-resistant finish to the leather. A possible drawback is that such a product will build up on the leather with continued use, where ordinary shoe polish wears away or can be removed with the usual type of cleaners which are mixtures of gum karaya and water, sometimes with soap added. When one gets a shoe shine, the boy scrubs the shoes with cleaner first. Water and mechanical action do the cleaning; the gum is present to give a thicker liquid so it will stick to the brush. This cleaner does not take off water-proof polish. However, both kinds of polish are sold. The water-proof type is no doubt more suitable for heavy-duty shoes than for dress shoes.

These emulsions are creamy liquids which can be packed in bottles, an advantage under present circumstances.

White Shoe Dressings

White shoe dressings cannot properly be called polishes, because their function is not to polish but to clean and whiten. They are commonly called cleaners rather than dressings, although what they accomplish is to cover up more than to clean. All of the modern products are water-base and contain a white pigment as the essential ingredient. With this has to be com-

bined a dispersing agent to stabilize the suspension and a binder to hold the pigment on the cloth or leather of the shoe. Sometimes an alkaline salt is added for its cleaning action. The cleaner is usually applied evenly over the surface of the shoe with a rough cloth,—sometimes the shoes are rubbed again when dry to remove any nonadherent pigment.

The earlier white shoe dressings had two features considered undesirable; they were unstable so that the solid material settled in a cake on the bottom, and the pigment on the shoe brushed off or rubbed off easily. To correct these defects, stabilizing agents and binders, respectively, were added. It developed, however, that changes in this direction could be overdone. If the liquid is too thick it may build up on the shoe and later streak. The best products of today aim at a happy medium in which the suspension is not necessarily thoroughly stabilized and some settling of pigment to the bottom of the bottle occurs. This must not form a hard cake, and the upper layer should not be water-clear but should remain milky. The appearance thus remains reasonably satisfactory although the product does require shaking before use. In this state the liquid is easy to spread to form a thin, smooth, coherent layer on the shoe.

Important changes have taken place in the formulation of these cleaners during the past few years. Commercial products of seven or eight years ago always contained lithopone as the pigment, probably because of its low price. The covering power of lithopone was sometimes improved by addition of zinc sulfide, which has better covering power. The newer products contain titanium oxide which has the best covering power of any known pigment, especially useful here because of its white color. Titanium oxide has been generally adopted even though its price is about three times that of lithopone, the latter selling at about five cents a pound. The relative hiding power of these pigments is as follows:[1]

Pigment	Hiding Power (Regular Cryptometer)
Lithopone	292
Zinc sulfide	430
Titanium oxide	560

Barium sulfate, sometimes used, is not a satisfactory pigment and not even a very good filler. Either plain whiting or precipitated chalk while not nearly as good as titanium oxide, is considerably better than barytes or barium sulfate.

One and a half per cent. of trisodium phosphate was frequently found to be present when the older cleaners on the market were analyzed. Since this is an alkaline salt it was added for the direct cleaning effect it might have on the shoe. After such cleaners had been used for a time, it was found that this degree of alkalinity in the product was harmful to the material of the shoe, and strong enough objections were made so that use of trisodium phosphate was pretty much discontinued.

Casein and resins are sometimes present as bodying agents and binders to make the pigment adhere to the leather or fabric of the shoe. Too much of such agents should not be used or they may have a cumulative water-proofing and stiffening effect, building up on the shoe and finally causing the leather or fabric to crack.

Examples of commercial products have approximately the following formulas:

1. Sulfated fatty alcohol	1%	2. Candelilla wax	1%
Dextrin	1	Diglycostearate	1
Disodium phosphate	0.2	Borax	0.5
Titanium oxide	18	Trisodium phosphate	0.5
Water	79.8	Casein	0.5
		Resins	0.3
		Titanium oxide	18
		Water	78.2
3. Methyl cellulose	5%	4. Sulfonated oil	4%
Sulfonated oil	2	Sodium borate, $10H_2O$	2
Titanium oxide	13	Boric acid	2
Talc	3	Casein	0.5
Clay	1	Titanium oxide	13
Water	76	Water	78.5

In Formula 1 the sulfated fatty alcohol serves as wetting and dispersing agent for suspension of the pigment, titanium oxide. The dextrin acts as binder, the disodium phosphate, which is much less alkaline than trisodium phosphate, as a cleaner. Such a small amount of this salt gives only a slight degree of alkalinity. The pH of disodium phosphate solution is about 8.3 that of trisodium phosphate something over pH 10.

In Formula 2 the wax is intended to add gloss to the finish on the shoe, diglycostearate serves as binder, borax probably aids emulsification, while the trisodium phosphate acts as cleaner; the alkalinity of the phosphate would be reduced somewhat by the buffer action of the less alkaline borax whose solution gives a pH of a little over nine. Casein and resins act as binders.

In Formula 3, methyl cellulose is the binder, while sulfonated oil serves as wetting agent and also has a softening effect which would counteract to some degree the stiffening action of the binder. Talc and clay are probably present as inexpensive extenders of the pigment, although the clay should have some thickening and suspending action.

In Formula 4, sulfonated oil is the wetting and dispersing agent, probably aided by the borate. Boric acid may be present to neutralize the mild alkalinity of the borax, resulting in a nearly neutral product. Casein acts as thickener and binder.

Method of Preparation

Manufacture of these cleaners is exceedingly simple, not even heat being required. The water is put into the kettle first and in this are dissolved with stirring the dispersing agent, the binder and any other water-soluble agents. The pigment is then sifted into this solution using high-speed agitation so that it will be uniformly dispersed. In some cases the pigment is first wet with a small amount of alcohol to aid dispersion; some manufacturers use a colloid mill. Neither of these is really essential to the production of a satisfactory product. When casein is to be added, it should first be allowed to swell and dissolve in water which has been made alkaline with ammonia, soda ash, borax or other alkaline salt. The solution can then be stirred into the water containing the wetting or dispersing agent.

White shoe creams have also been sold but do not appear to be as popular as the liquids. Such a commercial cream, packed in a small white glass jar, contained approximately the following:

Sodium stearate soap	9%
Sodium thiosulfate	4
Lithopone	75
Titanium oxide	0.5
Water	11.5

Sodium thiosulfate, a mild reducing agent, is probably intended to serve as a cleaner to remove some types of stains. The soap is the thickening, wetting and dispersing agent. The trace of titanium oxide is apits presence.

Most manufacturers face new problems arising from present emergency conditions. In some cases the cost of materials on which they have always depended has become excessive, in some cases materials have become very scarce, especially imports—even those from South America—and in some cases materials are no longer obtainable at all. With frequent changes in what is available, the manufacturer cannot rely on being able to merchandize any given product without having to modify its formula. Chemists are kept constantly busy devising the best methods for use of such materials as are on the market. Under these circumstances the manufacturer can only do the best he can; his ingenuity may solve some of his problems. Let us hope that he can carry on to satisfy the needs of the public, which certainly cannot be as critical nor as demanding as under peace-time conditions.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

In these times most manufacturers are faced in one way or another with the problem of modifying formulas of products. Here are suggestions for your problems.

[1] Henry A. Gardner. "Physical and Chemical Examination of Paints, Varnishes, Lacquers and Colors," p. 14. Institute of Paint and Varnish Research, 1939.

Dyes for Dental Therapy, Too!

In the long list of National Aniline products is a beneficent dye—Acriviolet. Used only in minute quantities, it has been widely adopted by the dental profession as a specific for certain forms of gingivitis and trench mouth as well as to prevent infection after extractions.

Acriviolet and its application to dental therapy is one of many activities of National Research, the same research that constantly widens the usefulness of our Dyestuffs, Biological Stains and Indicators, Certified Food, Drug and Cosmetic Colors, Synthetic Organic Chemicals for coating resins, Synthetic Detergents, Anti-Skinning Agents for paints and other unique products.

Consult National Technical Service concerning their application to your problems.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET NEW YORK, N. Y.

BOSTON	150 Causeway St.	SAN FRANCISCO	517 Howard St.	NEW ORLEANS	Masonic Temple Bldg.
PROVIDENCE	15 Westminster St.	CHARLOTTE	201-203 W. First St.	CHATTANOOGA	James Bldg.
CHICAGO	357 W. Erie St.	GREENSBORO	Jefferson Standard Bldg.	PORTLAND, ORE.	730 West Burnside
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BRANCHES AND DISTRIBUTORS THROUGHOUT THE WORLD

CHEMICAL SPECIALTY COMPANY NEWS

NAIDM Shifts to Chicago

SUMMER meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc., which was originally scheduled for the Hotel Hershey, Hershey, Pa., will be held at the Edgewater Beach Hotel, Chicago, Ill.

Dates remain the same—June 8 and 9, 1942.

Several matters arose in connection with the proposed meeting at Hershey which made it advisable to switch to Chicago, it was revealed.

This change was decided upon by the Board upon the proposal of President John N. Curlett in order to obviate several anticipated difficulties in connection with our meeting plans. If the members so desire, the meeting originally planned for Hershey this year can be held there a year hence. However, situations growing out of war-time conditions make this change definitely advisable at this time.

Pittsburgh for NPCA

National Pest Control Association, Inc., is making preparations for one of its most important conventions in many years—the 10th, to be held Oct. 26, 27, 28, at the William Penn Hotel, Pittsburgh, Pa.

Because of the multiplicity of standards and procedures under which enterprise must now work, over 400 members and non-members will be present at the convention.

Exhibit booth space is available and details may be had by writing to L. L. Crosby, chairman, Booth Exhibits Advertising Committee, 5131 Cypress st., Pittsburgh, Pa.

Test Your Wash Water

Test paper, which instantly indicates the strength of the wash water in a dishwashing machine, is being distributed by Mathieson Alkali. The paper, which is known as Super-Mafos test paper, is supplied in small perforated sheets bound in vest pocket-size booklets.

Each sheet of the paper is white with a band of deep pink printed across the center. To use, a strip is torn off and dipped into a small sample of the wash water. If the wash water is of the right strength for cleansing tableware, the white portions of the test strip will turn a shade of pink that closely matches the color of the central band. Too light a pink, or no color change at all, means that the water is too weak for proper cleansing, while the appearance of a red color that is deeper than the central band means that the water is too strong and that compound is being wasted. These color changes are due to the presence of phenolphthalein in the paper.

New Specialty Plant

Bri-Test Products Corp., 810 East 136th st., N. Y. City, has opened a modern plant manufacturing waxes, soaps, cleaners and polishes under the Bri-Test trademark and in bulk under private brands.

Company will shortly announce new formulas of interest to the trade.

Crown Defense Booklet

Crown Cork and Seal Co., Baltimore, has issued a pocket-size Manual for Civilian Defense which contains much useful information.

There is so much talk about blackouts and air raid shelters—the proper insignia for civilian volunteers and what constitutes practical first aid, that this booklet is handy to have around.

Company has a few more in stock which may be had for the asking as long as the supply lasts.

Save Your Anti-Freeze

Automobile owners can best save "Zerone" and "Zerex" anti-freeze fluids for next winter by leaving them right in the car's radiator, Du Pont chemists advised this month.

These two brands of anti-freeze, they said, were developed especially for year-around use, protecting against freezing in the winter and preventing rust and corrosion during summer months.

To save them this way it is necessary that cooling systems be absolutely tight, they emphasized, and that they be checked periodically against leaks and mechanical defects.

Draining "Zerone" and "Zerex" is recommended only when the radiator needs cleaning. A clean, tight cooling system, it was pointed out, is essential to efficient economical operation of the automobile engine.

If the cooling system permits leaving the fluids in the car, the chemists said, it will help relieve the demand for containers in which to store those types of anti-freeze which should best be drained from radiators during summer months in order to avoid damage to the car. Containers now are in greater shortage than the anti-freeze solutions themselves.

Motorists who save "Zerone" and "Zerex" by draining were urged by the chemists to take the following precautions.

1. Provide enough containers, usually 16 to 20 quarts, preferably glass because tin is short and may rust from outside.
2. Keep containers tightly covered, don't overfill, leave room for expansion.
3. Flush cooling system and protect against rust and corrosion by addition of reliable inhibitor.
4. Before reusing stored solution remove solids and foreign matter. For some brands, corrosion protection may have to be increased by adding a small amount of some reputable inhibitor.
5. Make a hydrometer check of the used solution and add enough of the same type or brand anti-freeze necessary to attain the desired degree of protection.

Magic Porcelain Glaze

One of several specialties of a similar nature put out by Magic Iron Cement Co., Cleveland, O., is this Magic Liquid Porcelain Glaze which finds many uses in repairing chipped porcelain surfaces on bath tubs, sinks, refrigerators, washing machines, etc.

The product is pure white, waterproof, and dries with a high gloss. It will not

crack or chip, the company claims, and hot or cold water will not affect it. Product keeps indefinitely without deterioration.

Application is a build-up process with small artist's brush.

Other products made by this company include Magic Iron All Purpose Liquid Glue, Magic White Tile Cement and Magic Wall Paper Grease Spot Remover.

NEW CHEMICALS FOR INDUSTRY

Pacific Lumber Co., San Francisco, recently took out a patent for combining redwood bark fibre with sheep's wool. Felting characteristics of "Palco Fibre A" are remarkable. Combinations range from 15 to 40% of bark fibre in the finished product thus enabling a saving in wool. Model holds hat of Palco.

Digest of Chemical Developments in Converting and Processing Fields

Wheeler McMillen, President, National Farm Chemurgic Council, addresses banquet gathering. Flanking Mr. McMillen are other featured speakers, Former Governor Lloyd C. Stark of Missouri and Louis Bromfield, novelist and chemurgist.

Chemurgy's Opportunity

By James M. Crowe, *Assistant Editor*

From all parts of the country agriculturists, scientists and industrialists gathered in Chicago recently for the Eighth Annual Chemurgic Conference sponsored by the National Farm Chemurgic Council. Industry challenges American agriculture to provide essential raw materials. Chemurgists have an opportunity which never before existed to demonstrate that they are capable of producing these raw materials.

CHEMURGY in war was the theme of the Eighth Annual Chemurgic Council of Agriculture, Industry and Science held in Chicago, March 25, 26 and 27.

The country's scientifically minded farmers and agriculturally minded industrialists turned out in record numbers to make this the largest and most active conference to date.

The chemurgists, whose objective is to advance the industrial use of American farm products through applied science, have long advocated self-sufficiency for America in a great many crops that enter into industrial products. It was, therefore, with justifiable pride that they reviewed some of their advocations and predictions.

There was an air of enthusiasm about the meetings which indicated that the chemurgists realized that the opportunity has now come for them to show what they can do and put into operation what they have been talking about.

Never before has American industry been cut off from so many raw materials and never has it needed them so badly. Industry is ready and eager for domestic products and if the chemurgists put into operation the many plans they have suggested for the past several years, the United States will be considerably aided in the war effort and will achieve independence in many commodities for which it has long paid a great deal of money to foreign markets.

The program got under way on Wednesday, March 25, at 12:30 p. m., with a luncheon address and welcome by Wheeler McMillen, President of the National Farm Chemurgic Council.

Then at two o'clock Louis J. Taber presided over the first general session and called Dr. Henry G. Knight, Chief, Bureau of Agricultural Chemistry and Engineering to speak on The Regional Laboratories in National Defense. Dr. Knight began with this remark from Vice President Wallace as he laid the cornerstone for the first of the four Regional Research Laboratories at Peoria, Illinois, on October 18, 1939, "It is a comforting thought to know that this great research laboratory that we are laying the cornerstone for today and the other three that are under construction in other parts of the country, could be turned into research institutions for National Defense should the occasion demand." America hoped that such an occasion would not arise. The government and Dr. Knight and his workers wanted them to be used to search for ways of helping the farmer to better utilize his crops and improve his standard of living.

But they didn't get their wish. The attack on Pearl Harbor just as the research programs in the laboratories were getting under way, threw them directly into work to aid the war effort.

"Let's turn now," said Dr. Knight, "to the work that is under way and see just what is being done in these laboratories, and how this work is fitting us to the program of National Defense. Naturally I can't tell you about all the work that is going on because some of it is of a confidential nature which I can't discuss. So I'll take a few of the more important topics that we can discuss and tell you about these.

"Nitrocellulose, or what we call guncotton, is the basis for modern smokeless powder, which we are manufacturing in this country just as fast as we can.

"The cellulose which is used in making nitrocellulose normally comes from cotton linters. Our supply of chemical grades of linters is normally sufficient to meet our own needs, but with this country acting as the 'arsenal for Democracy,' our supply of linters is not sufficient to meet the combined needs of this country and the countries we are supplying.

"Raw lint cotton has certain advantages as an alternative source of high-grade cellulose for use in an emergency, although, of course, it normally is too valu-

able for other purposes to be diverted to this use. In anticipation of a shortage of linters, one of the laboratories began last February to investigate the possibility of using lint cotton for making smokeless powder. After successful laboratory experiments, plant-scale investigations were carried out in cooperation with industry and the Navy Department. While the final results of these investigations are not yet available, there is every indication that they will be successful. The principal problem involved in using lint cotton in smokeless powder is cutting it quickly and efficiently to suitable lengths for purification and nitration with existing equipment. A new type of cutting machine is being developed which we hope will solve this problem. This project as you can readily see is wholly of a defense nature yet it is using an agricultural product of which there is a great abundance."

Dr. Knight went on to say that many other agricultural residues were being studied as sources of cellulose and then said:

"Some of the problems we are working on in these research laboratories involve the finding of domestic substitutes or replacements for imported materials which have been cut off by the war. For example, sandbags are a military necessity and are needed by the millions in warfare; yet, until recently, all sandbags were made from jute, or burlap if you want to call it by that name. Burlap is imported from India, and since the fall of Singapore it is doubtful if we can get enough now to meet even our sandbag requirements.

"Looking to such a situation as we would now be facing if we had to depend on India for our sandbags our cotton technologists suggested to the War Department long before the attack on Pearl Harbor that studies be made to see if cotton fabric couldn't be treated so as to make it satisfactory for sandbag purposes. It was pointed out that certain cotton fabrics which have the strength and quality required for sandbag purposes could be produced in large quantities in this country without much difficulty. The cotton technologists in one of our laboratories analyzed and tested a large number of commercially produced cotton fabrics, correlated the results with data obtained from service tests, and then used their findings as a basis for drawing up minimum specifications for use in purchasing cotton sandbags which the War Department is now doing. Shortly after the War Department adopted specifications for the purchase of cotton sandbags, our scientists were asked to conduct research to determine the most effective treatment for preserving fabrics against attacks by micro-organisms. In compliance with this request, our chemists and bacteriologists made exhaustive tests of practically all known preservatives and made the results available to the War Department. There is no way of calculating the dollar and cent value of research of this kind, but it is definitely of a defense nature and it does utilize one of our major farm crops. Projects like this that find defense uses for farm products are valuable indeed in times like these."

Dr. Knight then went on to tell of some of the other work that appears promising. One of these developments is fire hose without rubber and linen. As the result of a request from the Civilian Defense Administrator, the technologists of the laboratories are working with a large manufacturer of cotton fire hose yarn on a pliable plastic lined hose made entirely of domestic materials.

Another important program is the research on dehydration of foods. In America's efforts to supply our allies and our own forces with food and equipment, shipping space is very important and becoming more serious every day as submarines take their toll. Dehydration of foods not only reduces the amount of space that would be taken up by raw products, but it also saves on weight since most of the water, which is the weighty part of vegetables is taken out by dehydration.

Dr. Knight then reviewed the work being done on naval stores, tanning materials, nicotinic acid, proteins and other milk byproducts, soybeans, plastics, cellulose pulp, paper, low-cost building materials from agricultural residues, Penicillin, rubber and a rubber extender which has been developed by one of the laboratories.

Agriculture and the Petroleum Industry

Although power alcohol and other controversies have often reared their ugly heads between agriculture and the petroleum industry, Conger Reynolds of the American Petroleum Institute showed the great interdependence of these two fields, when he said, "It is not customary to think of petroleum research as agricultural research or of development of the petroleum industry as linked to the development of agriculture. But the contributions of the petroleum industry to agriculture are in both respects very large. Together with builders of internal combustion engines the petroleum industry has made efficient power farming possible in America. Such comparatively meagre advances as have been made in mechanization in Europe and elsewhere are largely forfeit in wartime, when productive efficiency is most needed, because of lack of fuel supplies. In this country, the preparation of two decades bears fruit in ability to increase the use of petroleum power in agriculture at the same time that great mechanized military forces are being supplied with petroleum.

"Aside from providing fuels and lubricants, the petroleum industry supplies many other materials of agriculture. In fruit growing the difference between success or failure is often merely a question of whether certain petroleum sprays have been used for control of insects. Despite electrification, it is estimated that 4,000,000 rural homes are still lighted by kerosene lamps. Petroleum-heated incubators and brooders are still a major factor in poultry raising. With wood available as it is on farms, it is rather surprising how rapidly rural use of oil burners is growing. Their automatic operation is a convenience which the successful farmer naturally seeks. Dairying has been greatly aided by the use of petroleum-base insect sprays,—and incidentally the eyes of the milker are today in little danger from the swishing tails of his cows if they have been well sprayed. Axle grease, though now little used on axles, is still in large demand to oil the hides of fattening porkers and thereby increase their contentment and rate of growth. Many thousands of pounds are being used also, especially in these days, to protect farm machines against rust.

"To a greater extent than is widely realized the oil industry is a direct purchaser of farm crops for use in conducting its operations of manufacturing its products. Sugar cane bagasse, wheat bran, and cotton seed hulls are used by oil well drillers to plug porous underground formations. Hay was once used in breaking oil field emulsions, but has been largely supplanted by excelsior. Starch has increasing use in keeping the constituents of well drillers' mud from settling in the bottom of wells. In refining and compounding oils and greases many thousands of pounds of tallow and tallow oil, lard and degras, oleic acid and glycerol, and other animal fats and products thereof are needed. Stearic acid, ordinarily made from animal fats, is a raw material in manufacture of candles and grease. Vegetable oils derived from flax, cotton, soybeans, rape, and castor beans, as well as oils and resins obtained from pine trees in quantities running into many thousands of gallons are utilized in making greases, polishes, floor oils, and other specialties. Furfural from oat hulls is an important refining solvent. Nearly two tons of nicotine per year, extracted from many more tons of tobacco plants, provide the active ingredient in sprays against insect life.

"The oil industry has frequently been criticized for its lack of enthusiasm for the idea of converting farm products into alcohol to be used as motor fuel. If that idea could be followed the bonds between the two industries might be cemented further. The petroleum industry might then buy not only the sub-surface, mineral oils available in the soil, but also some considerable part of the vegetation pro-

duced at the surface. I think I can properly say that the petroleum industry would be very happy to make motor fuel from farm products if to do so were practicable. If the time ever comes when alcohol can economically be substituted for gasoline or admixed with it, there will be no hesitation on the part of the petroleum industry about adopting it. All trustworthy research to date indicates, however, that the time is not at hand. Even in countries where military or political rather than economic reasons have forced farm alcohol into use, it has been discovered that a more satisfactory and cheaper way to supplement oil supplies is to make oil from coal, where coal resources exist. If we ever have to supplement petroleum in this country we are likely to turn to our ample supplies of oil shale and coal before we can soundly utilize farm products. Of these facts your organization is well aware through its own investigations. Your research staff and your president have recognized that for the present at least industrial uses for farm products must be sought elsewhere than as raw materials for motor fuel. The good will between the petroleum industry and the agricultural industry have been measurably increased by the definite stand of your organization against the compulsory legislation on this subject so often proposed by motivated or misguided persons or groups."

Dairy Chemurgy

F. C. Atwood, President, Atlantic Research Associates, Inc. reported that the dairy industry very early felt the need for increased production. "The record of the dairy industry for 1941 shows: more milk produced on farms than ever before; the highest levels of domestic consumption of milk and dairy products in the nation's history; larger exports of dairy products than in the previous ten years combined.

"The dairy farmer for 1942 is faced with a major task of increasing production by another eight per cent. over 1941. This calls for nine and one-half billions of pounds more milk this year which the Government feels is necessary to provide for greater use of milk and milk products at home and to supply dairy products for shipment to Great Britain and other nations under the lend lease agreements."

The magnitude of these figures makes us stop to think of what great importance is any development in chemurgy which affects this country.

"The chemurgic program for the dairy industry has progressed very well this past year. A little over a year ago on one of these programs, I showed some wines made of milk whey. Modification of that process would make available substantial quantities of alcohol as such or transformed into vinegar where desired. The dairy industry has proven methods for alcohol manufacture if responsible officials finally decide to make alcohol from other carbohydrates than cane sugar to take care of the increasing war requirements.

"Pure lactic acid and lactates are increasingly valuable by simplified and economical production methods. Suitable electrolytic baths of lactic acid have been developed by the Sealtest group of chemists which readily and quickly put a high polish on most metals and alloys. The metal is immersed in a lactic acid bath containing also certain other ingredients and a D. C. current is imposed. The metal serves as an anode and a cathode such as copper is employed. In five to ten minutes the metal is electro-polished. This process appears applicable to certain army and navy ordnance alloys, zipper slide fasteners, surgical instruments, cathode tube parts, pen points, and so forth.

"Sodium lactate is replacing glycerine in many cases, a timely and important job with glycerine so in demand for explosives.

"Lactose or milk sugar is still a potential source of sweetening if and when other sweetening agents become less available that now, or more restricted in their use.

"Casein paints are more than doing their share in camouflage, passive defense and black-out work. Formulae have been carefully tested and prepared and many paints made up and used. Casein glues are similarly finding many uses in the war program.

"By far, the major dairy chemurgic development to reach the public recently deals with the transformation and transmutation of the protein of milk-casein into a fibre of textile utility. It is with this development that I am more familiar personally. Last year at this conference, I had to limit my remarks to the use of this fibre in hat manufacture. Although I had complete faith in the utility of this fibre in textiles, yet a year ago our output was limited to a plant built for 1000 pounds production to 2000 pounds per day and in the same plant we had pushed this production to over 4000 pounds per day before closing it on July 1st.

"Sixty days ago our output was 400,000 pounds per month. Currently, it is 500,000 pounds per month. We are quite hopeful that by the middle of the summer we may be shipping approximately 1,000,000 pounds of fiber per month. In spite of this, the entire output of aralac has been sold up through June; that is, for the next three months based on our current production."

Milkweed Instead of Kapok

Kapok (Bombax Cotton) is floss from Kapok trees (Bombaceae family). It is important at the present time because it is used in life preservers and life jackets, especially important because cork is likewise not available at the present time.

The chief producers of Kapok are the Dutch East Indies, Ceylon, British India, South Asia, Central and partially South America. The chief consumers are the United States, Holland, Australia and New Zealand.

Dr. Boris Berkman of Chicago suggests that the milkweed plant is an excellent replacement for Kapok. He says:

"If we compare the Milkweed pod with the Kapok pod they are strikingly of similar structure and approximately the same size. It is also apparent when you compare both fibers that they are identical fibers. But in order to convince yourself that Milkweed floss and Kapok probably have the same properties one must only look at a micro-photograph of both fibers. Both fibers have a wide lumen and very thin walls. In other words, both have an air-cell. Comparative studies of the physical dimensions show almost the same size diameter of the fiber and approximately the same length. The ash content of both fibers is almost identical. Silky appearance, high degree of luster, lightness, softness are physical qualities characterizing both fibers. The buoyancy of Kapok and of Milkweed floss is the same, due to the air-cells in each fiber. The insulating qualities of the floss are slightly better than of Kapok, the insulation index for Milkweed floss ranging from .207 to .24; for Kapok .24 to .25. Both fibers have elasticity or springiness which causes them to fill confined spaces and which prevents packing after long periods of time. Kapok, as well as Milkweed floss, does not retain moisture because of the waxy coating of their fibers; they are not readily wetted by liquid and for that reason are suitable for bedding, mattresses, and pillows in moist climates. Being vermin proof on account of high cellulose content both Kapok and Milkweed floss are very sanitary.

"From the preceding comparative study of the physical and chemical structure of the fibers it is self evident that Milkweed floss can be used as a substitute of equal, or even superior quality, for Kapok. During the present emergency Kapok that is imported from Java and Sumatra, as well as from Ceylon and the Malayan Peninsula is not available; and cannot be substituted by Brazilian Kapok that grows in limited quantities and is of lower quality as far as buoyancy and insulation qualities are concerned. This leaves only Milkweed floss as the logical and most important substitute for Kapok."

New Crops for War and Peace

Dr. Paul J. Kolachov, Director of Research and Development for Joseph E. Seagram & Sons, Inc., brought to the attention of the Conference six crops which are always important but essential in wartime and advocated that something be done about growing them in the United States. They are perilla and rapeseed for quick-drying and edible oils, eucalyptus

(*Continued on page 517*)

NEW PRODUCTS AND PROCESSES

By James M. Crowe

A FASTER, more economical process for plating strip steel with tin has been announced by the Electrolytic Division of E. I. du Pont de Nemours & Co., Inc. and is being tried experimentally at several plants where stock for tin cans is made.

Known as the "Halogen Tin Process," this process employs a neutral solution which is said to eliminate sludging and the consequent waste of tin common to many electrotinning methods.

Strip steel for containers is said to be tin-plated twice as fast with less electric power by this process as by the "alkaline" electrotinning method, thereby reducing substantially labor and power costs.

A thinner, more uniform coat of tin can be applied to strip steel electrolytically than by the conventional "hot dip" method, resulting in savings of from 40 to 65 per cent of the tin used.

A larger percentage of tin cans henceforth will be plated by electrolytic processes because the War Production Board has limited drastically the amount of tin for containers, and thin coatings of the metal will be necessary.

Tin deposited by the Halogen process, it was said, can be heated without discoloration either when tin-plate is heated to obtain the bright finish required by some can manufacturers or when treated during the process of applying lacquers or enamels.

New Wetting Agent

An improved wetting and emulsifying agent, "Dresinate," for use in conjunction with all types of alkaline metal cleaners has been developed by the Research Department of Hercules Powder Company.

The new material assists aqueous alkaline solutions in certain applications to replace some of the chlorinated solvents, now scarce because of the shortage of chlorine.

The penetrant, a finely divided, uniform powder, is available in practically unlimited quantities at a lower cost than the common emulsifying agents used by the metal cleaning industry, the company's announcement says.

The new cleaning aid is suggested for use in conjunction with trisodium phosphate, sodium metasilicate, caustic soda, soda ash, borax, and other alkaline detergents. Its use is indicated for cleaning metal prior to rust-proofing, lacquering, painting, or plating.

Research work carried on at the Hercules Experiment Station indicates the material is suitable for metal cleaning operations where an alkali cleaner is used to remove grease, oils, soil and organic materials.

"Addition of 3 to 15% 'Dresinate' to an alkaline cleaning solution, while it reduces the alkalinity slightly, nevertheless increases the detergency of the solution," the company says.

"The wetting action of 'Dresinate' puts a thin film of alkaline liquid uniformly over the metal surface, wetting out oily areas equally as well as areas free from oil. The emulsifying action assists the alkaline cleaner to get the foreign material in suspension and carry it away.

"The material can be mixed with alkaline cleaners without special equipment since it is a dry powder, readily and completely soluble in water. Alkaline solutions containing the material are rapidly rinsed from metals, speeding the time required for the cleaning operation."

Rubber Plasticizers

Two new plasticizers said to be suitable for synthetic and reclaimed rubber have been announced by the Beacon Co. Known as Bunnatol G and Bunnatol S, both materials are insoluble in mineral and vegetable oils, giving the finished rubber a greater resistance to greases and oils. The Bunnatols are also said to act as wetting agents for pigments.

New Organic Chemicals

Four new synthetic organic chemicals available in research quantities have been announced by Carbide and Carbon Chemicals Corporation.

N-Ethyl Morpholine is a colorless, water-miscible liquid boiling at 138°C. It is a cyclic tertiary amine with potential uses as a solvent for dyes, resins, and oils, and as an intermediate in manufacture of dyestuffs, pharmaceuticals, rubber accelerators, and emulsifying agents.

Acetoacet-O-Toluidide, $CH_3COCH_2CO\text{-}NHC_6H_4CH_3$, is a fine white, granular powder with melting point of 106°C. It is similar to acetoacetanilide and is used as intermediate in manufacture of "Hansa" and "benzidine" pigments.

Dimethylethanolamine, $(CH_3)_2NCH_2\text{-}CH_2OH$, is a colorless, amine-odored liquid which is miscible with water and benzene. Its properties are similar to diethylethanolamine. Suggested uses are in the synthesis of dyestuffs, textile auxiliaries, pharmaceuticals, and corrosion inhibitors. Its physical properties are: boiling point, 133°C.; specific gravity at 20/20°C., 0.887; equivalent weight, 89; refractive index, 1.4300.

Cellosolve Benzyloxyglycol (Ethylene Glycol Monobenzyl Ether), $C_6H_5CH_2\text{-}OCH_2CH_2OH$, has a high boiling point of 255.9°C. It is suitable as a high-boiling solvent in lacquers, dyestuff pastes, printing inks, and in coating compositions for paper, leather, and cloth. Its specific gravity at 20/20°C. is 1.0700. It has a solubility of 0.4 per cent in water.

Black-Out Coatings

Many black out coatings for windows have been put on the market recently. Among them is one called "Protex Shatter-Proof Black-Out Coating #4" developed by Douglas Distributors, Inc.

It has been said that investigation of civilian casualties from air raids in England showed that bomb fragments, falling walls, etc. accounted for many casualties, but that the greater number, as high as 90% resulted from flying debris, particularly shattered glass.

The British tried painting glass with a latex compound which proved successful in all respects except that the latex base of the compound decomposed and made it necessary to coat the windows every five or six weeks.

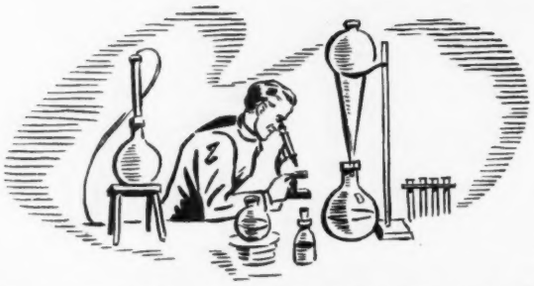
With the help of an American company which had a successful experience in treating trees, plants and shrubs with a protective latex compound, conditioning agents were formulated which gave the latex an effective life of a year or more without impairing its ability to bind glass fragments together.

The same chemists who worked on this problem have now perfected this new product, "Protex Shatter-Proof Black-Out Coating #4," which utilizes a substitute for latex.

The material is brushed on the inside of windows and dries to a thickness of 3 one-thousandths of an inch. It is impenetrable to light and washes off readily with water. Effective life is said to exceed one year and coverage averages 275 square feet per gallon.

Another product that Douglas Distributors is putting out is an outside blackout coating. It is well known that a blackout coating applied to the inside of windows gives them a mirror-like appearance, consequently the necessity of outside coatings.

The new product known as "Protex-Rowe #200 Outside Black-Out Coating" is said to be a chemical formulation having no reflective properties and has the added advantage of filtering out infrared rays. The material is sprayed on, has a coverage of about 300 square feet per gallon, dries hard in 30 minutes, will not burn and is rain proof. The company claims that it is easily removed by kerosene.

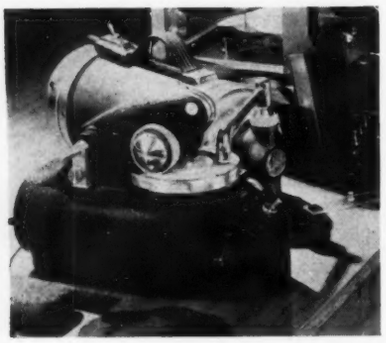


THE LABORATORY NOTEBOOK

Abraser Pickup

The Taber Instrument Corporation has announced its improved Abraser Vacuum Pickup Model HV-42, an accessory to the Taber Abraser standard method for measuring resistance to abrasion of surface finishes.

The primary function of the Vacuum Pickup is to prevent accumulation of abradings from interfering with the normal wear action of the Calibrase wheels. Its principal application is for the removal of abradings that may become imbedded in the weave of textile fabrics, also the fine powder from certain types of organic coatings that tend to cling to and build up on the face of the Calibrase wheels.



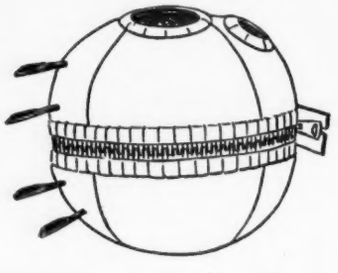
The Taber Vacuum Pickup is of tubular design for standing on the table alongside the Abraser and has a nozzle rotatively mounted on the suction end of the housing so as to swing in and out of position relative to the specimen holder. The nozzle holder can also be adjusted vertically to the proper height above the specimen by turning the knurled collar located on the stem. The contaminated air is drawn through the nozzle and connecting tube into the high speed centrifugal pump, then through a special filter bag which passes only clean air back into the room. The bag can be quickly and conveniently removed for emptying by unsnapping the two catches holding the exhaust and to the main unit permitting the cloth receptacle to be lifted out for cleaning.

The motor is the high speed universal type designed for operation on any electrical circuit of 110 to 120 volts. The toggle switch for starting and stopping the motor is conveniently located at one end of the lifting handle.

Safety Heater

The Scientific Glass Apparatus Co. displayed its new electric flask heaters at the Chemical Exposition last December. The development of this "Glas-Col" heater was started by an accident in the laboratories of one of the large chemical companies where an open flame under a flask caused an explosion.

The mantle of this heater is constructed by fitting first a layer of glass cloth having special heat resistant qualities about a mold in the form of two hemispheres. A second layer of glass cloth contains the heating element which is woven spirally from the bottom upward. The spacing between the turns is small at the bottom and increases toward the top of the flask. The result is that about 75 per cent of the wattage is placed in the lower half of the heater.



The size and resistance of the heating elements are chosen so that it will not be necessary for them to operate at red heat. Over the heating elements is placed an insulating layer of glass wool bats. A third and final layer of glass cloth in the form of two hemispherical parts forms the external surface of the heater. The two halves of the heating mantle are held together by a Talon fastener.

INDUSTRY'S BOOKSHELF

Organic Syntheses, Vol. 21, Edited by Nathan L. Drake, John Wiley and Sons, New York, 120 p. $1.75.

This twenty-first volume of an annual publication of satisfactory methods for the preparation of organic chemicals continues the fine work of earlier volumes.

For those not familiar with the series the plan of the book is to simply give methods of procedure for the laboratory preparation of organic compounds.

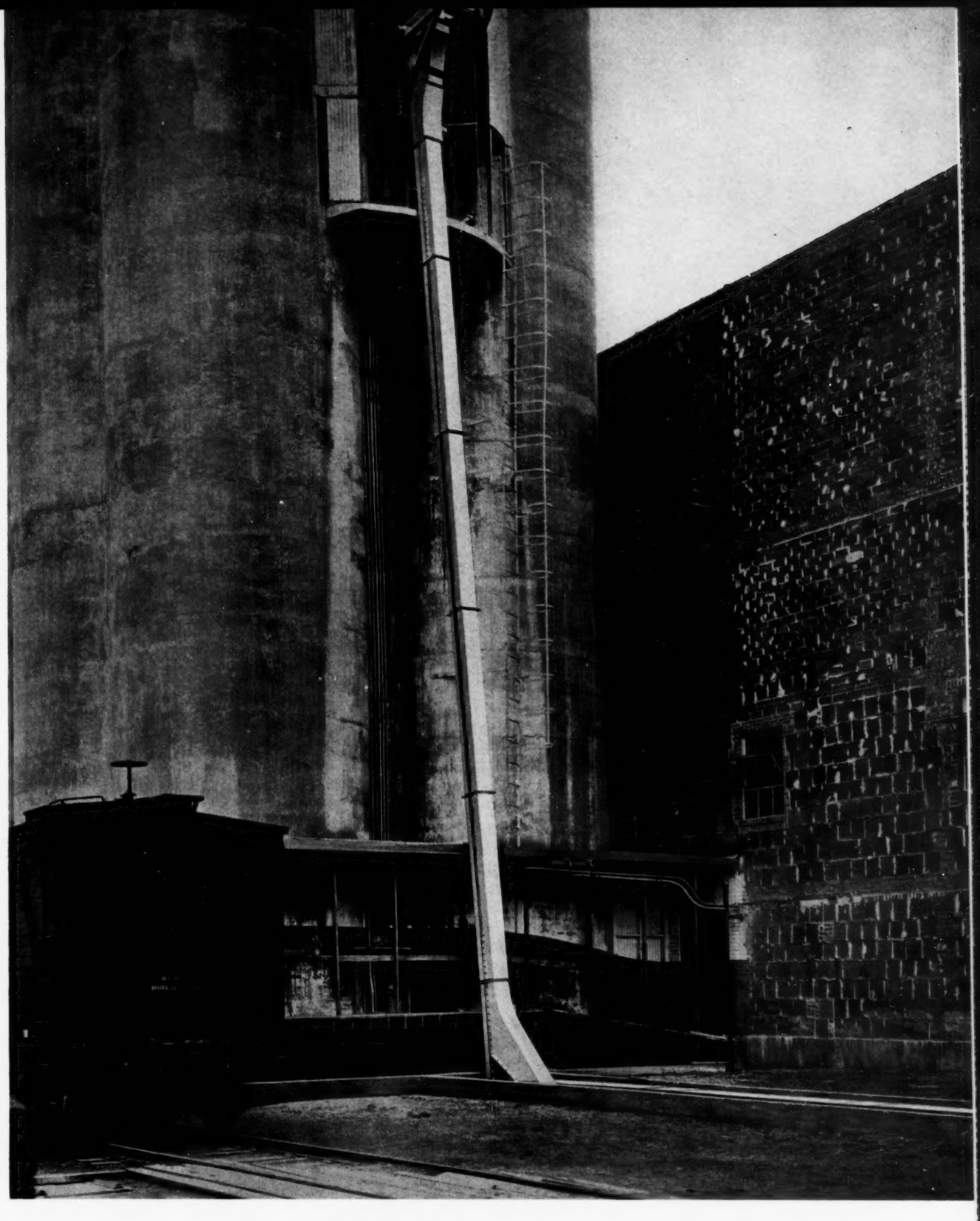
In this volume thirty-eight compounds are given. They are: Acenaphthenol-7; acetoacetanilide; alloxan monohydrate; aluminum tert.-butoxide; o-aminobenzyl alcohol; n-caproic anhydride; catalyst, raney nickel; cholestenone; 1,2-diamino-4-nitrobenzene; 2,6-dihydroxyacetophenone; 3,5-dihydroxybenzoic acid; 3,3'-dimethoxy-biphenyl and 3,3'-dimethyl-biphenyl; m-dodecyl (lauryl) mercaptan; dypnone; 2-ethylchromone; ethyl diacetylacetate; ethyl 1,16-hexadecanedicarboxylate; ethyl B-phenyl-B-hydroxypropionate; hemin; 2-hydroxy-1,4-naphthoquinone; dl-isoleucine, ketene dimer; kryptopyrrole; lactamide; dl-leucine; mesitoyl chloride; w-methoxyacetophenone; methyl isothiocyanate; methylthiourea; B-naphthaldehyde; a-naphthonitrile; 1,2-naphthoquinone-4-sulfonate, ammonium and potassium; 2-nitro-p-cymene; dl-phenylalanine; resacetophenone; tetranitromethane; m-tolylbenzylamine; 2,4,6-trimethylbenzaldehyde.

Chemical Engineering Plant Design, Second Edition, by Frank C. Vilbrandt, McGraw-Hill Book Company, Inc., New York, 452 p. $5.00.

This book first published in 1934 has now been revised so that appreciable contributions to many of the subjects, which have appeared in the technical and trade literature, might be incorporated.

The principal changes are in the chapters on Development and Plant Location, with less extensive revision in many other parts of the book. A great many references to the literature published after 1934 have been added.

These revisions and additions enhance the value of this work as a tool in attacking the problem of developing a technically sound and economically efficient plant process from the laboratory stage through the pilot plant to the large scale unit.

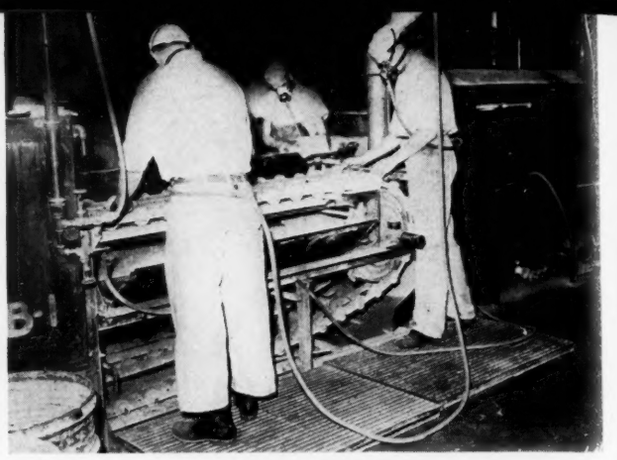


PLANT OPERATION AND MANAGEMENT

Link-Belt Bulk-Flo elevators can be used for handling chemicals, coal, sawdust and other materials. Here is an installation in service at the plant of Commercial Solvents in Peoria, Ill. This model is a 60-foot lift for delivering shelled corn to buck elevator extending to top of storage silos. Note railroad siding.

Digest of New Methods and Equipment for Chemical Makers

Maintenance of Health



IN CHEMICAL INDUSTRIES

By Henry F. Smyth, Jr., Ph.D.
Mellon Institute, Pittsburgh

INDUSTRY must devote thought and money to protecting the health of its workmen so that they may remain productive. This is a matter of particular importance today when a shortage of skilled hands is a very real problem, and time lost in an accident cannot be recovered. Allocation orders may replace broken equipment but they cannot replace the incapacitated workman who had spent months or years in acquiring his skill. State departments of health and labor, the U. S. Public Health Service, and the insurance companies have redoubled their efforts to protect industrial health, but the immediate plant management can do much more if it is informed and actively interested.

In proportion to the potential hazards of processes and products, few workers in the chemical industries receive injuries to health. This is particularly surprising when one considers that all the accident hazards of the mechanical processes may be present in the chemical plant in addition to the dangers inherent in the raw materials themselves. However, in chemical processes fewer men are needed to produce a ton of product than in many other industries and there is less human handling of that product. Thus, the particular toxic and irritant properties of chemicals are partly counterbalanced by less opportunity for contact between man and material.

This matter of contact is the crux of health maintenance in chemical industry. Few measures other than reduction of contact will prevent injury to health. The many industrial chemicals which do not manifest their full potential health hazards in use are those which, by their physical nature or manner of use, contact the worker to only a limited extent. Ability to contact the man is the important factor which distinguishes between the toxicity of a chemical and its practical hazard.

Thus, in considering the safety of a given material, one must know both its physiological properties and the way in which it is to be employed. Any chemical compound can be handled safely if the need for it is great enough to justify the care required.

New Materials

Annually for several years, fifty or more new chemical raw materials have been offered to industry. Many of these may have been handled by only one development group before samples are distributed and limited lots are made available for use. It is of course impossible to study completely these new materials before their release to the trade. However, several chemical manufacturers employ or retain groups of research workers who spend much of their time in experiments to determine the processes and fields in which these new compounds may be safely used. Federal, state, and private research agencies also study the question, particularly when the new materials are likely to be sold to the ultimate consumer in foods, drugs, and cosmetics. All of these groups must consider not only the toxicity of the compounds, but also those physical properties which influence the probability of contact with the body.

The greater part of this experimental work must be performed upon animals, although skin contact hazards can safely be studied on humans. By judicious choice of species, from the mouse to the monkey, one can find an animal whose liver, for instance, acts like the human liver and thus is suited to studying liver poisons. Unfortunately, quantitative data from animals is not translatable into human doses, but qualitatively the results are reliable. That is, if one studies the action of a new chemical upon several wisely chosen animal species, and finds that its most important injury is upon the blood forming organs, one knows that the physician responsible for the worker's health can depend on this action to detect early injury from the chemical. Only intelligent observation of workers by physicians guided by the results of animal experiment can determine with certainty what degree of contact between man and chemical is safe.

Once this safe degree of contact is decided upon, the engineer can plan processes and the supervisor can carry them out so that excessive contact is avoided. The chemist and physician check on the success of this program by examining respectively the environment and the workers.

Cumulative Action and Elimination

Some inorganic materials, particularly lead and radium, are stored in the body. This stored material continues to injure for a long time even if no more is being absorbed. Contrasted with this, few, if any, organic compounds remain in the body more than a matter of hours or days. They are eliminated or destroyed fairly rapidly and any cumulative effect they manifest is due to the piling up day after day of small injuries from continued absorption. During hours away from work there is repair of some or all of the injury when the body is adequately nourished and otherwise in good health. Thus shortening the period of exposure improves a man's processes of repair. Also, when a man stops working with most organic materials, he slowly repairs any damage and recovers from injury. This is not necessarily true for injury from benzol, for there are records of men who have grown more ill from the effects of benzol after stopping work with it. This is because the injury is mainly upon the blood-forming organs, and, after it reaches a certain stage, repair is very difficult. With lead and radium progress of the disease after stopping contact is even more frequent.

Because organic compounds are eliminated from the body, this process must

Photo at top of page (from "Occupational Hazards") shows men in a battery plant breathing pure air from their respirators. They stand on a mat to reduce dust disturbance and lead oxide dust is removed by exhaust under the conveyor.

This chemical worker wears protective clothing and a respirator to guard against toxic fumes.

be studied. Often it allows simple chemical analyses performed on urine, for instance, to measure the degree of a man's contact with a dangerous material before this contact can injure him. Benzol is partly eliminated as a sulfate in the urine, and the widely used urine sulfate test measures the immediate past exposure of the man, sometimes more accurately than air analysis could do. Some methanol leaves the body unchanged in the urine and an analysis of this fluid will likewise measure a workman's recent exposure to methanol. Such tests are needed for industrial chemicals which can cause slowly developing chronic poisoning.

In the case of volatile organic compounds, a large proportion leaves the body through the lungs, but only when the concentration in the air being breathed is low. For this reason, rest periods during the working day are of more value if they are spent in pure air, for thus the maximum of volatile compounds is allowed to leave the body.

External Contact

First in importance industrially among kinds of exposure is direct contact with the skin. We have the primary irritants and the sensitizers. Soluble acids, alkalis, anhydrides, aldehydes, etc., are primary irritants which, at some concentration, will injure the skin of nearly everyone. This injury ranges from the spectacular blister of the true vesicant to simple reddening of the skin from dilute acid solutions. When prolonged or often repeated, contact with primary irritants may lead to disabling skin lesions. Many solvents are classed as primary irritants for they dissolve the fat from the skin and leave it cracked and chapped, easy prey to bacterial infection.

Protection against the primary irritants requires prevention of contact. This may be accomplished by the use of tools in place of hands, in some cases by wearing impervious clothing and gloves, and in others by the use of one of the protective creams which have been compounded to resist the action of specific groups of irritants. Rubber gloves are seldom satisfactory for continued protection for they develop unseen holes, they retain perspiration and splashed irritants and they themselves irritate many skins. Accidental contact with strong irritants should be followed by flushing with water or other solvents, never by neutralization.

The sensitizers are more mysterious. Some workmen are already allergic to certain chemical compounds, and some become allergic as a result of contact. Once the condition develops, a very minute contact with the offending compound can produce such a severe skin eruption that the man is disabled. Asthmatic symptoms also are not uncommon. A man may use a given compound for days or even for years safely, then suddenly become allergic and from then on be unable to go near it again. Chemicals vary in their ability to sensitize skin but some dermatologists claim that every compound can sensitize someone, some way.

Protection against skin sensitizers requires prevention of contact by every possible means. Those chemicals known to be active sensitizers should not be used where they must contact the skin of workmen. Every precaution should be taken to prevent any massive contact because apparently the accidental heavy exposure is more likely to sensitize than is repeated light exposures. Protective creams help prevent enough contact to produce allergy but once a man is allergic to a given chemical a cream may not protect him. Those with skin diseases are more easily sensitized than those with normal skin. Continued contact with primary irritants aids sensitization, and washing after work with thinners and harsh cleansers is equally bad. The use of toilet creams helps to keep the normal protective barrier of the skin in condition to resist sensitization by replacing fat removed by solvents.

Solids, fluids, and even vapors may cause serious injury when they enter the eye. The so-called chemical burn of the eye may of itself destroy sight, or infection of the eye during recovery from the burn may have the same result. Protection involves avoiding splashing, keeping the hands away from the eye, and in some cases, the wearing of vapor-proof

On this plating bath acid mist is removed by local suction at the front edge. ***(U. S. Dept. of Labor Photo)***

goggles. This is one accident where immediate treatment may prevent serious trouble. The eye should be well flushed at once with large amounts of water. Attempts to neutralize the offending chemical only aggravate the injury and even a minute's delay in flushing may sometimes cost an eye. Unfortunately, a few chemicals cause no pain in the eye and the victim is not aware of the injury until several hours later, when the only possible treatment is to keep him comfortable and avoid infection, usually best accomplished by hospitalization.

After skin irritation, the most frequent injurious contact in chemical industry is vapor or dust inhalation. Single exposure to too high a vapor concentration is an accident which produces various stages of anesthesia with most volatile organic compounds, although asphyxia from oxygen exclusion may result from the extremely volatile ones and severe lung irritation from others. Precautions, such as protective equipment and a routine for entering storage tanks, are well known in most plants. It is not so well known that inhalation of such low concentrations of vapors as 200 p.p.m. of toluene produces the earliest stage of anesthesia so that an exposed workman finds his judgment and association impaired and may be a menace to himself and others by his thoughtless reactions.

Day after day inhalation of low concentrations of some vapors and dusts may produce industrial disease. For the more familiar materials there are accepted figures of maximum allowable concentration. These data were arrived at by observation of humans in industry, but they imply healthy workers with about 16 hours a day to recover from each exposure. Thus, under peak production schedules where workmen are under physical strain or living disturbed lives, these accepted maxima should be reduced.

For protection against the effects of repeated excessive inhalation, the escape of vapor and dust to the working air should be minimized, local ventilating systems should be installed to remove them at the source, and when chemical estimation in the air is not available and removal is impractical, less toxic materials or less volatile solvents should be used. Only occasionally is it necessary to provide masks or airline respirators for men to wear continually for protection against vapors, and, in any case, when the more toxic materials exist in the air of a plant, periodic medical examination of the exposed workmen is very desirable.

The term "warning properties" is often used in regard to odor or irritation from vapors which will warn a man he is inhaling too high a concentration. These properties may prevent a man from remaining too long in a situation which can injure him during a few hours, but no warning property is adequate to protect him against the low concentration which may produce injury following exposure for protected periods.

A less frequent cause of industrial illness is absorption through the skin. A few chemicals penetrate the skin rapidly enough so that 20 ml. or thereabouts, spilled on clothing may result in illness or death. There is not always the warning blue skin which aniline gives and one may be unaware of the accidental spill until irrevocable harm has been done. Fortunately, few chemicals have this property of rapid skin penetration. The remedy is obvious—avoid skin contact, and never wear grossly soiled clothing. The same attention to clean clothing will much reduce the probability of skin sensitization.

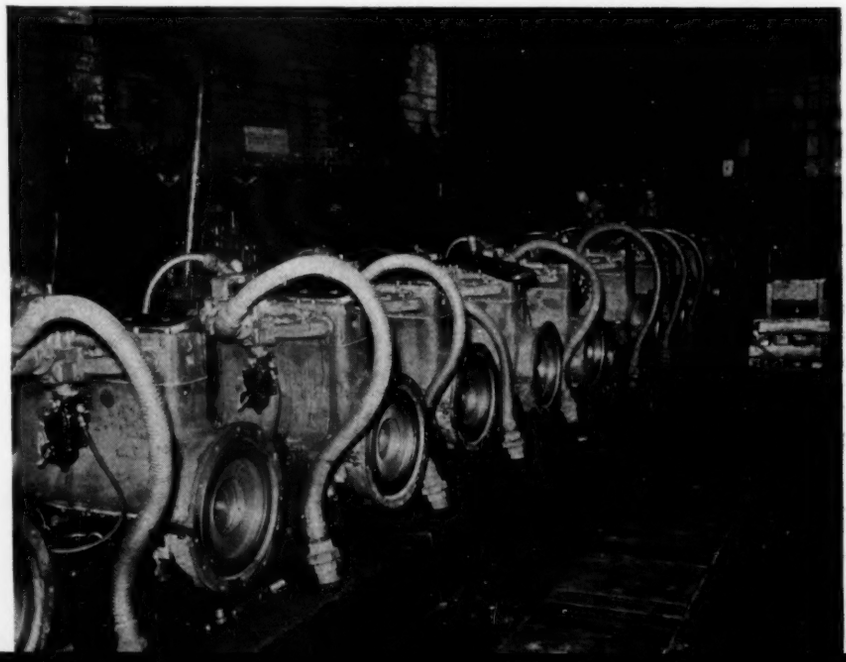
It is seldom that industrial chemicals enter the body in injurious amounts through the mouth, although this route is important with the cumulative inorganic poisons such as lead. One guards against such entry by keeping stores out of reach, by proper labeling of containers, by forbidding eating or chewing in dangerous areas, and by seeing that hands and face are washed before meals.

Occasionally a chemical is especially dangerous when it enters a wound because it rapidly reaches the circulating blood, but this is rare and easy to guard against.

We have now covered the portals by which chemicals may contact or enter the body to injure it. Measures aimed at increasing general health help reduce injury, some vitamins appear to counteract the action of certain chemicals, and something can be done by selecting men who are good risks in advance of exposure, but the chief precaution is to reduce or eliminate contact.

The management must know the hazards of its raw materials and products in order properly to protect health in its plants. Adequate labeling of all materials entering commerce so that their chief hazards may be known is a help to everyone but no fixed policy has yet been generally adopted. One valuable point we must not neglect is education of the workmen to recognize health hazards and to help reduce them.

At this test block carbon monoxide is removed by flexible pipes leading to an exhaust manifold. ***(U. S. Dept. of Labor Photo)***



CHEMURGY'S OPPORTUNITY

(*Continued from page 510*)

and camphor for industrial plants, and stramonium and cinchona for medicine and pharmacy.

In discussing these crops, Dr. Kolachov described the economic background of the products and their uses, regions of cultivation, botanical descriptions, method of cultivation, harvesting, refining, and properties of derived products.

Domestic Sources for Essential Oils

The subject of essential oils became a large and important question for American industry as the kaleidoscope changes in world events disrupted the markets of an industry, old as human records. However, Percy C. Magnus, president of Magnus, Mabee and Reynard, Inc., in his strong plea to the Conference for a domestic essential oil industry stated, "Here is a golden opportunity which should bind the Americas together. Here is an opportunity to make the Western Hemisphere self-sufficient and not dependent upon foreign sources of supply which we may awaken some day to find belligerent and with trade routes precipitantly cut off.

"Prior to World War I, we were practically dependent upon foreign countries for the major portion of our supplies. To be sure, in the United States, we are raising some important oils, I cite, Oils Peppermint, Spearmint, Tansy, Erigeron, Cedarleaf, Cedarwood, Wormseed, Wormwood, and others. However, their uses in dollar volume are relatively small when compared with the quantities and the value of other equally important Essential Oils which we are importing from foreign shores.

"Let us review a few important ones, namely Oil Coriander, Caraway, Anise, Dill Weed, Lemon, Orange, Lavender Flowers, Almonds.

Why is it that the commercial production of Oil Coriander Seed cannot come into being in our United States?—A most important ingredient in condiments, spiced meats, tomato catsup, tobacco products, pharmaceutical preparations and the like. Leading universities, colleges, pharmaceutical schools have, to the best of my knowledge and belief, successfully proven that we have the soil, the climatic conditions and other contributing factors for this profitable production. These experiments have proven conclusively that American ingenuity, American science and scientists can free us from dependence upon foreign shippers.

"Consider Oil Caraway Seed—so important in American manufactured products, used to a great extent in the manufacture of condiments, spiced meat products and those referred to above. We are told that this plant grows wild in America. Why can't it be harnessed and cultivated?

"The very fact that we have and are now raising and distilling many important essential oils is the strongest, possible proof that we can raise, produce and distil other important oils which heretofore have placed in the cash registers of foreign firms many millions of dollars. The problem has been recognized in some quarters and a substantial start has been made. For example, a forward-looking concern in the Far West, realizing the importance of Oil Dill Weed, some years ago experimented, the results were encouraging. The seeds were planted, a crop was harvested, the weed was distilled—the results were most acceptable. They enlarged—they grew—and today the production of Oil Dill Weed is suffice to satisfy the great demand in this country and it is a prophesy which we believe will come true, that not only will our production in these United States be ample for our own requirements, but we will be in a position to successfully compete for export business.

"This condition, I am sure, will exist with many others as we continue to educate our farmers to make them realize that domestic production is a necessity of life and not a luxury. All must realize that we should see and seize the opportunity of changing the labels on the containers used in our industry from 'Made in Germany,' 'Made in Japan,' 'Made in Italy,' to the great red, white and blue label 'Made in the U. S. A.'"

Rubber for Peace and War

Rubber, one of the biggest questions of the day, came in for its share of discussion by the chemurgists as Dr. Paul J. Kolachov, Director of Research and Development, Joseph E. Seagram & Sons, Inc., advocated for domestic development, Kok-Sagyz, the Russian dandelion. Dr. Kolachov reported that Russia undertook a study of its rubber situation twelve years ago and after many searches found this plant and concentrated upon it and synthetic rubber to provide its requirements. In his introductory remarks Dr. Kolachov said, "We have carefully investigated the Russian work on natural rubber and definitely believe that the plant developed by them, Kok-Sagyz, can be successfully cultivated in the United States." He then went on to give the history of the plant, regions of cultivation, botanical description, method of cultivation, harvesting, yields of rubber, economic aspects and a bibliography of Kok-Sagyz.

Creating New Wealth with Tung Trees

W. M. Smith, Jr., Technical Advisor to the Reasor Tung Plantations, Inc., reported on the domestic cultivation of tung trees. He said, in part, "The interest of the public in general, and chemurgists in particular, has lately been focused on our American tung industry as representing both the creation of new wealth and the successful introduction of a foreign agricultural industry into this country.

"The first successful tung plantings were made in 1906 and for years progress was slow. In 1930 the United States Census of Agriculture showed a total of 350,793 tung trees and the census of 1940 gives the total trees planted April 1, 1940, as 12,671,344—an increase of thirty-five fold in ten years. The distribution of plantings, shown by this census, was: Mississippi 74.8%, Louisiana 13.9% Florida 9.6%, Alabama 0.8%, Georgia 0.6% and Texas 0.3%.

"Plantings as of April 1, 1942, should approximate 250,000 acres. Surely any business which has made such an amazing growth has shed its swaddling-clothes and can no longer be regarded as an 'infant industry.'

"This article is not intended to treat with the subject of tung tree culture. That has been considered in 'Practical Development of Commercial Tung Orchards in America,' presented at a recent Chemurgic Conference. A few pertinent and recent facts may be summarized as follows:

"America has imported as much as 175,000,000 pounds of tung oil from China in a single year.

"The United States Department of Commerce has stated that our normal annual domestic consumption of tung oil amounts to 150,000,000 pounds.

"Our total imports for 1941 approximated only 33,000,000 pounds, but little more than one-fifth of our normal requirements.

"The 1941 domestic crop of tung nuts should yield about 5,000,000 pounds of oil.

"Due to difficulties in exporting the oil, the Chinese are finding new uses for it. Much larger quantities are being used for illumination and cooking, and, combined with rape-seed oil, it is being made into gasoline.

"Research chemists are just begining to realize the potentialities of the tung tree. There are indications of many medicinal and chemical properties; preliminary studies have been made of the leaves, green nuts, pomace and hulls, and all of these show promise of worth-while results. Some authorities claim that the meal may come to have a value greater than the oil.

"There seems to be a very real need for a tung research laboratory where a detailed study of the entire tree, the oil and the byproducts could be undertaken. This could be established by one of our southern universities, by the Government or by a company practicing research for their own benefit. The tung producers would be only too glad to cooperate by furnishing all materials which might be needed for research.

"It has been estimated that the tung

(*Continued on page 535*)

NEW EQUIPMENT

Gas Filled Cable QC 169

A timely means of safeguarding industrial power lines was described by G. B. Shanklin, cable engineer of General Electric Company, at the annual meeting of the Missouri Valley Electric Association recently held at Kansas City, Mo.

This new safeguard is gas-filled cable, now economically applied up to 138 kv, which permits immediate detection of any intentional or accidental damage to its sheath. Gas-filled cable has been installed recently by several utilities, but only for 10 to 40 kv service.

According to Mr. Shanklin, a newly developed lead-alloy sheath has extended the application possibilities. It possesses all the desirable characteristics of the sheath used on the low-voltage cable and, in addition, has greater strength. This enables it to carry the increased gas pressures required in the medium voltages without a proportionate increase in the thickness of the sheath.

Gas-filled cable is housed in a lead sheath filled with dry nitrogen under pressure. Any damage severe enough to cause a leak in the sheath permits the escape of gas. Lowering of the pressure sets off an alarm at the power station. Thus forewarned, the operator can investigate immediately and make repairs to avoid service failure, or if the leak is small, pressure can be made up from stand-by cylinders pending permanent repairs.

With the new lead sheath, working gas pressure of the cable can be increased safely to at least 24 lbs. according to Mr. Shanklin. The cable now in use has a gas pressure of only about 12 lbs. per sq. inch. Corresponding voltage stress obtained with the gas-pressure at 24 lbs. increases to 90 volts per mil. This is a gain of 38.5 per cent in voltage rating as compared with low pressure system operating at 12 lbs. pressure. For the same voltage rating, the corresponding reduction in insulation thickness is 27.5 per cent.

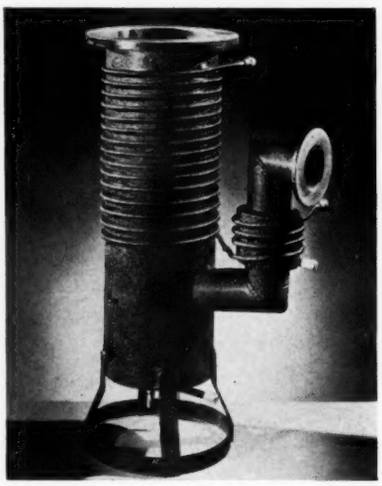
"Regardless of whether the object is to increase voltage rating or decrease insulation thickness for a fixed voltage, this theoretical gain is offset by the increased costs of the special alloy sheath," Shanklin said. "The lower the voltage rating the more pronounced this offset becomes. Because of these conflicting cost factors this particular type of medium pressure system has an economic voltage range from 40 kv to 69 kv.

"Above 69 kv, such as 115 kv for instance, three-conductor cable becomes too large to be economical. There is some promise, however, in single-conductor cable above 69 kv. Here, the extra cost of the gas channel construction and the alloy sheath are offset by other savings. All told, we consider this simplified, medium-pressure, gas-filled cable system an important technical and economic advancement.

"For voltages above these limits, such as 138 kv for instance, gas pressure from 150 to 200 lbs. per sq. inch is necessary and the most economical design is cable drawn into a steel pipe."

Vacuum Pump QC 170

Designed for use with forepumps having low volumetric efficiency at pressures below 1 mm. of Hg., a new high capacity metal vacuum pump, known as the Metal Booster Pump, Type MB-200, has just been announced by Distillation Products, Inc.



This 2-stage oil diffusion unit will boost the pumping speed to 200 1/s. and will carry the vacuum from .5 mm. to 5×10^{-5} mm. of Hg.

The unit is small and compact, having a vertical casing 6 in. by 20 in., and is readily connected to large mechanical pumps by 1½ in. standard pipe fittings or in the optional model illustrated by a 2 in. i. d., 4 in. o. d. flange.

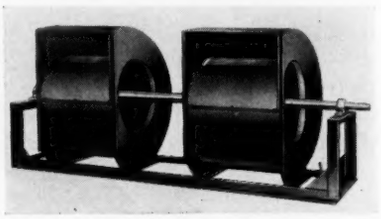
The vacuum attainable is sufficient for metal sputtering and evaporation, ultracentrifuges, vacuum insulated flasks, and drying chambers.

Blowers QC 171

Production of Motor Blower Units in a wide range of sizes is announced by the Niagara Blower Company. The new blower units are applicable to industrial and commercial ventilating, drying, heating, cooling, exhausting, processing and air conditioning requirements.

The Niagara Blowers are available in sixteen models. These are produced in one, two and three-fan assemblies to meet resistance up to 4" S. P. and in capacity from 880 C. F. M. to 42,600 C. F. M. Fan speeds range from 300 R. P. M. to 1750.

The blowers may be secured with or without casings. They are belt-driven or direct connected and are said to be especially designed for simplified application to duct systems.



Units are available in two series of fan designs. Series 1100 gives large volumes of air with quiet operation at low fan speeds for static pressures up to 1½". Series 1200 meets the resistance of duct systems and special conditioning equipment, protecting motors from overload by a retarded horsepower curve, for static pressures up to 4".

Bracket for Mixer QC 172

The Eclipse Air Brush Co. has announced the addition of two V-shaped brackets to hold its direct drive air motored agitators. These brackets are made in two sizes; to wit thirty- and fifty-gallon drums.

There is a screw clamp at the side of the bracket to allow for variations in the sizes of the drums, and to insure steadiness of the Pneumix agitator. The mixer can be adjusted to any angle.

The use of the Pneumix with the new holder does not change the spark-free operation of the mixer.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 169	QC 170	QC 171
QC 172	QC 173	QC 174

Name .....

Title ..... **Company** .....

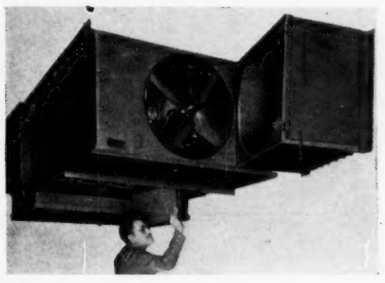
Address .....

Humidifier QC 173

A new industrial humidifier manufactured by the Carrier Corp. is now available for textile mills, paper and printing plants and other industries where control of humidity is important in manufacturing, or for the storage of hygroscopic materials such as chemicals, leather, etc.

It is claimed that low cost humidification is provided with the unit which is compact, easily installed and low in power consumption. Ceiling suspended for saving floor space, the industrial humidifier may be moved readily to accommodate equipment layout changes. Suitable for use in single or in multiple, the unit affords flexibility when mill extension or alterations are made.

Available in two capacities, these humidifiers will provide 4800 or 6150 cubic feet of humidified air per minute, and evaporate up to 96 pounds of water per hour.



Along with humidifying the air, the unit cleans, circulates and heats the air during winter. In summer the unit may be operated to provide evaporative cooling, cleaning and uniformly circulated air.

Extrusion Press QC 174

An improved 125-ton extrusion press which permits simultaneous loading and extrusion has been developed by The Watson-Stillman Co. The first of these units will extrude carbon mixtures but the press is also suitable for extruding any plastic material.

The press has two containers, mounted on a swinging arm. Operator starts the automatic extrusion cycle by push-button control, then devotes undivided attention to loading the free container. The container arm is provided with lifting cylinders for easy swinging and with hold-down cylinders to seal container against die during extrusion.

The main ram is 12½" in diameter and has a 12" stroke. Advance speed is 54" per minute, pressing speed is 6.4" per minute at 2000#/sq. in., and return speed is 150" per minute. Power is from two Vickers pumps driven by a 5 H. P. motor. The complete unit is 10' high and 4' x 3' floor space.

PLANT OPERATIONS NOTEBOOK

Rubber Conservation

The B. F. Goodrich Co. has issued six pamphlets on the subject, "How to Get the Most Service Out of Industrial Products." Titles of the six pamphlets are: No. 1, "Transmission Belting"; No. 2, "Conveyor Belts"; No. 3, "V-Belt Drives"; No. 4, "Belt Salvage"; No. 5, "Rubber Hose"; No. 6, "Mats and Matting."

Because of its widespread use in the chemical and chemical specialty industries we reprint below the material on rubber hose contained in pamphlet No. 5.

Some of these suggestions on how to increase hose life may seem elementary. However, it may be helpful to you to review these recommendations with those in your organization charged with maintenance, in the interest of stressing the increased need for conservation of rubber equipment.

General Hints on Hose Care

Protect from oil. The first rule in taking care of any rubber product is to keep it away from oil. Most hose which is exposed to a great deal of oil today is built of synthetic rubber. Other hose should be thoroughly cleaned after temporary exposure to oil or grease.

Do not kink to stop flow. Use the shut-off nozzle for this purpose.

Do not crush reinforced hose. Extra care should be given to wire-reinforced hose to prevent trucks running over it, or to keep sharp, heavy rocks or tools from falling over it. Wire woven hose *can* be bent back to shape by pounding with a mallet, although it will obviously shorten the life of this hose, and may in some cases completely ruin the hose length.

Do not hang on nails. Although few people would be guilty of this obvious misuse, it is well worth while considering the use of reels or to coil hose to give it the greatest protection when not in use.

Storage. If you have hose which must be stored for any period of time between operations, be sure that it is kept in a cool room, away from direct sunlight. It is important that hose is thoroughly cleaned if it has been exposed to oil or acids while in operation.

Buy quality hose. One of the best ways to conserve *any* rubber product, even in an economy of plenty, is to *buy the best quality* product for the job to be done. Industrial hose should also be bought in *correct* sizes—both as to diameter and plies of rubber and fabric.

Select proper couplings. This is so important to best hose service that a separate section of this folder describes best methods of attachment.

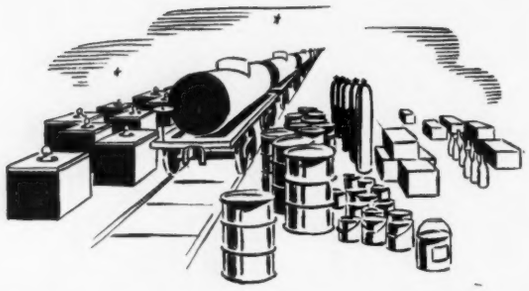
Steam Hose

The most important thing to remember in any steam hose operation is to work within the limits of the recommended working pressures for the hose you use. Be sure in the first place to buy hose *designed for the pressure* you will actually need in your operations. Otherwise, your hose purchase will be uneconomical . . . and *unsafe* to the man working with the hose.

Some other points helpful to steam hose users:

1. Do not allow high pressure steam to condense within hose when pressure is turned off. This creates a vacuum and causes the tube to pull away from the carcass.
2. Remember that heat is what shortens hose life more than anything else. Superheated steam at a given pressure is more damaging than saturated steam at the same pressure.
3. Do not expose to burning heat. Hose with a woven asbestos cover is available for this type of use.
4. When exposed to fats, grease and oil, wash outside cover daily, and drain hot water from hose after every use.
5. Guard against hose being plugged, since pressure can back up and cause undue strain and burning of fabric plies.
6. Do not allow hose to freeze when not in use.

(To be Continued)



PACKAGING & CONTAINER FORUM

By Richard W. Lahey

Bag Production Increased

AN order (M-107) designed to increase the production of cotton bags for agricultural and chemical products was issued on March 10th by the War Production Board.

A shortage in such bags has developed because of an ever-increasing demand by the Armed Services for cloths formerly used for agricultural bags, such as burlap and osnaburg, coupled with a decreased supply caused by the war in the Far East.

Bags are needed for such agricultural products as grains, flour, feed, meal, vegetables, nuts, sugar, salt, coffee, seeds, potatoes, beans, peas, etc; and also meats, fertilizers, metal abrasives, and chemicals, inventories of both the bag manufacturer even though not agricultural products.

Today's orders define certain constructions (that is, cloth of specified width, thread count, and weight) of osnaburg, sheetings, and print cloth as "cotton textile fabrics suitable for agricultural bags" and then assign a high priority rating (A-2) to all orders for such fabrics. This is expected to result in increased production of these fabrics, since mills capable of converting their looms to make these fabrics will be required to fill orders for such fabrics even though they might prefer to devote their capacity to other goods.

In order to prevent hoarding or speculating, the order places limitations on the inventories of both the bag manufacturer and the bag user. The object is to have the cloth converted as rapidly as possible into bags, and then have the bags available to be filled as quickly as possible with food stuffs, and not tied up under contract to a person who will not actually use them until some later period.

With that in mind, the order restricts a bag manufacturer to a 60 days supply of cloth. This will result in a wide distribution of the fabrics for conversion into bags.

The order also restricts the bag dealer or the user of bags to a 60 days supply of bags. This will insure a prompt filling of the bags and will prevent unfair distribution of the bags.

WPB officially announced that a prompt return of bags by those receiving products in bags, particularly woolen and worsted mills, will result in alleviating the situation.

The Textile Section of the War Production Board explained, in response to several inquiries, that under the Cotton Bag Order (M-107) any bag manufacturer whose existing orders for cotton bag fabrics listed in the order as "Cotton Textile Fabric Suitable for Agricultural Bags" have been only partially filled, can assign a preference rating of A-2 to the unfilled balance for any of these fabrics.

These fabrics include osnaburg, sheeting and print cloth fabrics of certain specified construction.

Packing Paradox

A campaign by the Sherman Paper Products Corporation, Newton Upper Falls, Massachusetts, has been inaugurated to relieve the drastic shortage in shipping containers. Offering Corroflex which, while not a container, does the work of many different varieties of containers; this campaign presents rather startling claims about savings that are possible in packing for shipment.

Flexible corrugated, is a corrugated paper product that folds like uncorrugated paper. This material, it is claimed can take the place of other container materials that often weigh five times as much and require far more space for the same amount of protection. In the automotive industry, for example, this material is used in place of crates for packing large, ungainly parts like hoods, grills and fenders. Not only are the final shipping units smaller, but the products can be "nested" in shipment, producing additional space savings.

It is claimed that Corroflex can go a long way toward relieving the drastic shortage in shipping containers. Results, in present defense industries which are using it, show that it can also save in vital transportation space and weight.

Burlap Maximums Upped

Increases in maximum prices established for burlap—to meet additional costs of shipping caused by the war—are permitted under Amendment No. 1 to Revised Price Schedule No. 18, according to announcement made by Leon Henderson, Administrator, of the Office of Price Administration.

The amendment, effective March 3, '42, permits only the addition to the maximum prices of actual cost incurred for increased war risk insurance and ocean freight over the rates prevailing when the maximum prices were originally established.

When Price Schedule No. 18 for burlap was issued August 16, '41, the then prevailing war risk insurance rates of approximately 2½% were considered and given due weight in determination of maximum prices for the product. At that time there also prevailed an ocean freight rate of approximately $25 per 40 cubic feet of space or 16 cwt.

Since October 15, however, war risk insurance rates from India have increased to as much as 10%. This increase in cost of imported burlap, OPA indicates, cannot be absorbed by the burlap importers and importing bag manufacturers without so reducing the importers' margin that in many instances there would be monetary losses on some shipments. The present amendment will give protection to the importers with respect to this cost item.

At the present time ocean freight rates have not increased above the rate prevailing at the time the original schedule was issued. Indications are, however, that such freight rates may be increased and the present amendment makes provision against that contingency by enabling importers to adjust price ceilings automatically with any increases in this item.

The amendment provides that where either of these charges are added to the former maximum prices, the amount of the increase must be itemized on invoices to the buyer. The charges are permitted on sales of burlap in stock if the sale is made on or after March 3 and if additional costs were actually incurred with respect to the burlap sold.

Container Thickness Explained

The WPB Containers Branch pointed out that the November 1941 changes in specifications for paperboard shipping containers were not intended to establish maximum thicknesses for the materials used in making such containers.

Modified regulations governing the shipping of freight in corrugated and solid fibre board containers were announced

LET Heekin's colorful metal lithography put sales punch in every one of your products. Heekin Lithographed Metal Cans . . . stand up under abuse of light and weather. Please your prospective customers with a pleasing package . . . you've got to please 'em to sell 'em. That's what puts money in the cash drawer of the retailer. Heekin's superior metal lithography is inexpensive . . . that's why so many hundreds of manufacturers in all lines use Heekin Lithographed Cans. THE HEEKIN CAN CO., CINCINNATI, OHIO.

on November 3, 1941. These specifications, permitting the use of thinner paperboard parts, were expected to save approximately 10 per cent of normal paperboard consumption.

Since that time the Containers Branch has been advised that some shippers believe that the new specifications were meant to be maximum rather than minimum requirements.

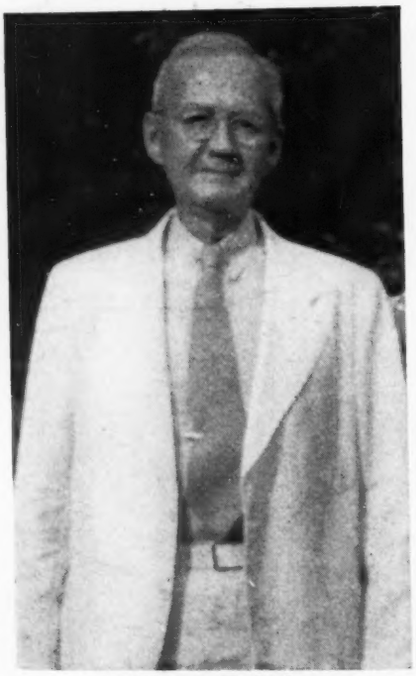
This is not true, the Branch said. While the change in the specifications—Supplement 17 to Consolidated Freight Specifications Number 14—reduced the minimum requirements, it was not intended to affect packing of articles requiring a stronger box. The revised specifications must be exceeded in some cases, it was pointed out, in order to transport certain commodities safely.

The Branch emphasized that it does not advocate the use of inadequate shipping containers. If shippers were to adopt the minimum specifications, which became effective November 15, 1941, as maximum specifications, there might be greater losses in goods and materials than could possibly be equalized by savings effectuated by modified specifications.

Heavier loads of cars and rougher handling, not only by the railroads, but all along the line of production, necessitate the continued use of discretion on the part of shippers.

Col. Carleton Retires

Colonel Guy E. Carleton, of the Bureau of Explosives, retired on December 31st last, because of ill health. Col. Carleton has served with the Bureau of Explosives



Col. Guy E. Carleton

since July 7, 1909 with the exception of his army service in the first World War.

He graduated from West Point in 1901 and was first assigned to the Artillery Corps and then to the Ordnance Department. When he was called back to service in the first World War he was appointed head of the Inspection Division, Artillery and Trench Warfare, Ordnance Department, and saw service overseas in England and France. He was retired on October 4, 1918 with the rank of Lieutenant Colonel.

Col. Carleton started with the Bureau of Explosives in 1909 as their Pacific Coast representative. He was later called to their main office in New York City, where he was placed in charge of the Test and Specification Department. He developed the present container specifications which are now a part of the I. C. C. Regulations for the Transportation of Explosives and Other Dangerous Articles. Only those who are familiar with these specifications can appreciate what a colossal task this was. Certainly this must be a satisfying accomplishment for any man to look back upon.

Colonel Carleton has been an associate member of the Metal Barrels and Drums Committee, the Poisonous Articles and Miscellaneous Packages Committee, and the Carboy Committee of the Manufacturing Chemists Association since they were organized. He has also been a member of the Container Committee of the Compressed Gas Association.

Shippers of dangerous articles have long appreciated how zealously Col. Carleton has guarded the public safety. He has always been ready to help shippers work out safe containers and safe methods of shipment. Those of us who have been privileged to know and to work with "the Colonel" will cherish those associations.

Great Britain and the Container Problem

EDITOR'S NOTE: *The following outline of the British organization which has been set up to conserve containers and materials of fabrication, is extremely interesting. This is a three sided problem in which the container consumers, the container manufacturers and the manufacturers of the container materials must cooperate to obtain the most satisfactory solution.*

It will be noted that Britain recognizes this by including in their committee personnel not only the container users but the distributors of the product.

Recently the W. P. B. appointed a committee of steel drum manufacturers to standardize steel containers. It is hoped that this committee will seek advice of the users of these containers before they make any recommendations. The results to date, of the Container Standardization Committee of the Manufacturing Chemists Association is conclusive evidence of what savings in strategic materials can be made by container users. It seems logical that users are in a better position to conserve containers because they have the intimate knowledge of the minimum protection a container must provide in order to have their products arrive at destination without damage.

The following is taken from a Memorandum [CF(PAM)9486] issued by the Packaging Industry Committee of the British Standards Institution:

With the spread of the war the availability of the various materials used in packaging has steadily deteriorated. We are now at a stage where we have reached the level at which the availability of packaging material may be the deciding factor as to whether certain commodities are made.

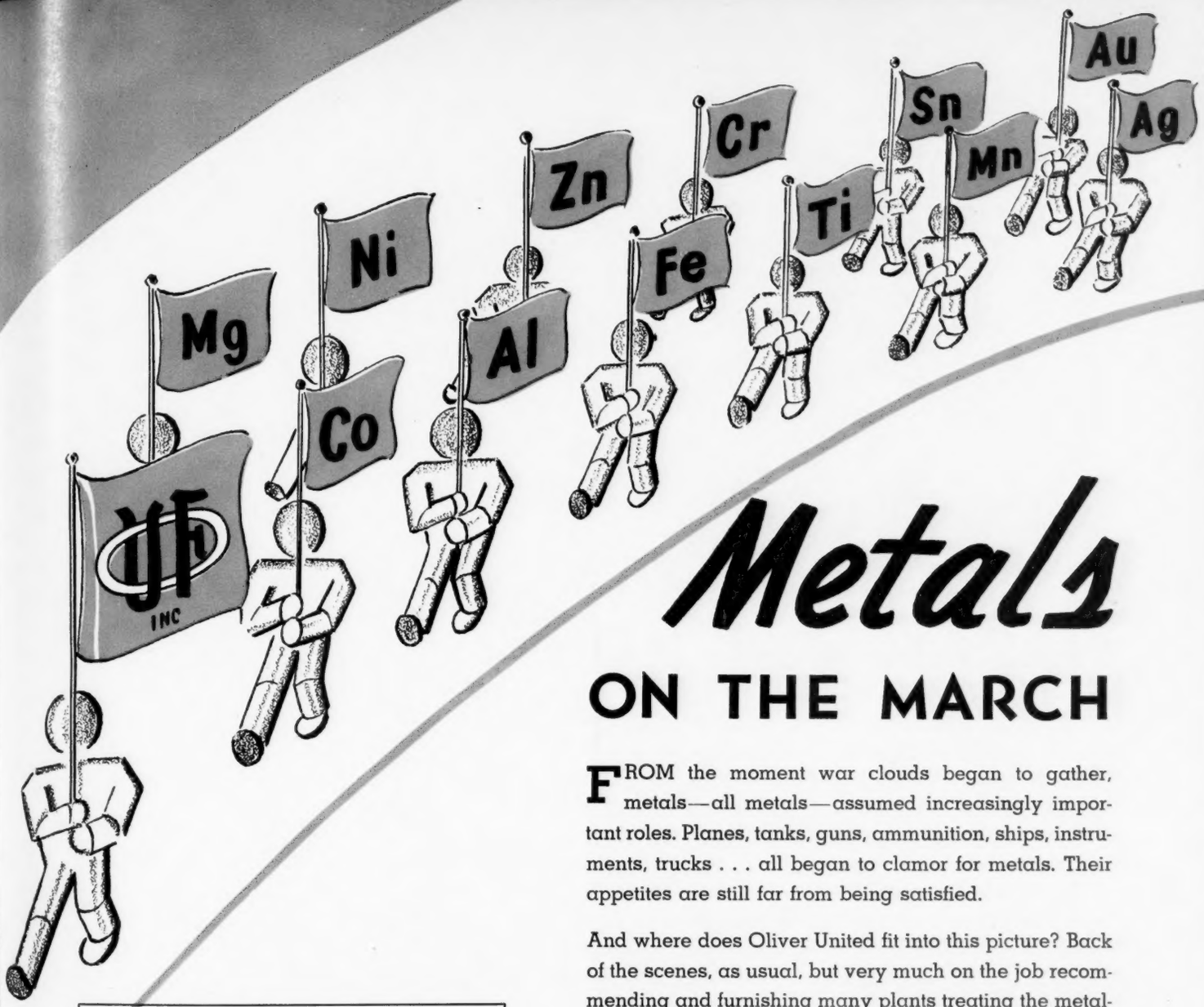
Problems to be Solved

A Packaging Sub-Committee, under the chairmanship of Lord Burghley, has been charged with the task of making recommendations to the Materials Committee of the Production Executive on the types and sizes of containers to be used. On the instructions of this Sub-Committee, the British Standards Institution has set up committees, representatives of the packers, the container manufacturers and the distributive trades in each section of the prepacked goods trade to formulate proposals for their consideration. The situation calls for a complete sacrifice of the personal interests of all parties, and consideration of the problem in each trade from the point of view of the nation at war. The various committees have been instructed to take into account the possibility of economizing in labor and manufacturing capacity at every stage in production, in transport and distribution, and in retailing. The problems can be summarized as follows:

(1) Is the commodity essential; is it in short supply, or is it subject to any such statutory restriction as limitation of supply?

(2) Is pre-packing necessary, and if so (a) What is the minimum range of prepacked sizes that will suffice to meet barely the public demand or rather the public's minimum need? (b) What is the largest minimum size practicable, the size being governed to some extent in the case of those materials in short supply by the necessity of securing as widespread a coverage of the public as possible? (c) What is the most economical packing material? and (d) What is the smallest amount of packaging material that is required for each size?

Over 100 trade committees have been formed, and detailed recommendations are in process of being submitted to the Burghley Committee.



Metals ON THE MARCH

FROM the moment war clouds began to gather, metals—all metals—assumed increasingly important roles. Planes, tanks, guns, ammunition, ships, instruments, trucks . . . all began to clamor for metals. Their appetites are still far from being satisfied.

And where does Oliver United fit into this picture? Back of the scenes, as usual, but very much on the job recommending and furnishing many plants treating the metal-bearing minerals with the proper type of filters. For example, we recently sold filters to plants treating minerals bearing the essential metals noted above. To help produce these "Metals on the March" we furnished such units as Oliver, American and Dorrco Continuous Vacuum Filters; Oliver Hopper Dewaterers; Sweetland and Kelly Pressure Filters.

Wide selectivity of filter types—there are others besides those noted above—and our thirty-five years of experience should be helpful to you in the processing industry in finding the solution to your filtration or clarification problems.

Basic Types of

OLIVER UNITED FILTERS

from which you can select

Oliver Continuous Filter
Oliver Precoat Filter
American Continuous Filter
Dorrco Continuous Filter
Oliver Top-Feed Filter
Oliver Hopper Dewaterer
Oliver Pressure Filter
Sweetland Pressure Filter
Kelly Pressure Filter
Oliver-Campbell Cane Mud Filter
Oliver High Density Thickener
Oliver Pulp Filter
Oliver Pulp Washer
Oliver Lime-Mud Filter
Oliver-Borden Thickener
Oliver Board Forming Machine

4-OUF-3

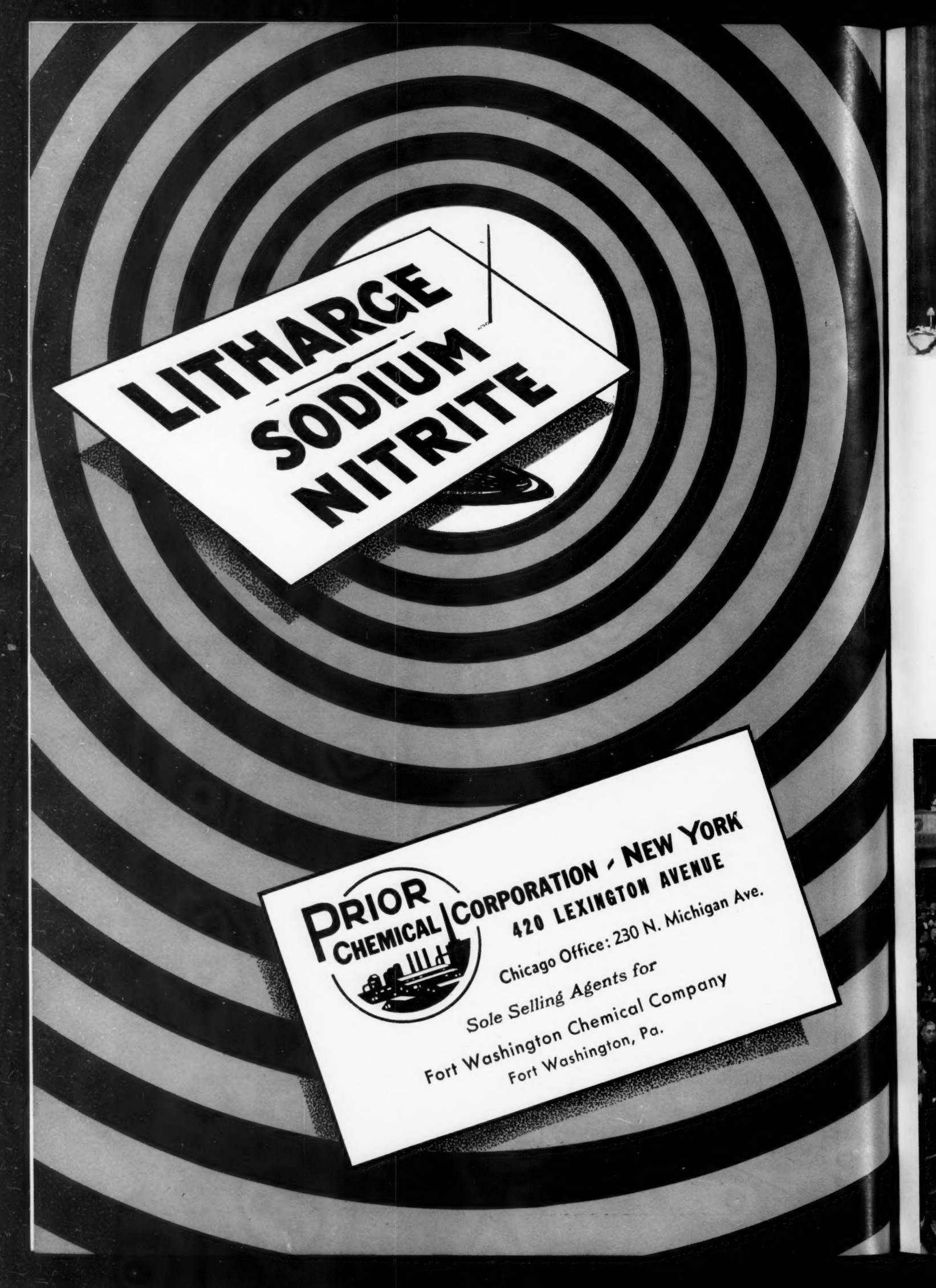
OLIVER UNITED FILTERS INC.

New York, N. Y.
33 West 42nd St.

Chicago, Ill.
221 N. LaSalle St.

Oakland, Calif., 2900 Glascock St.

Factories: Hazleton, Pa.—Oakland, Calif.—Orillia, Ont., Canada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Chicago Office: 230 N. Michigan Ave.
Sole Selling Agents for
Fort Washington Chemical Company
Fort Washington, Pa.

17th Annual DCAT Banquet Draws a Record Crowd

Patriotically donating proceeds to the American Red Cross, the Drug, Chemical and Allied Trades Section of the N. Y. Board of Trade held its 17th annual banquet March 12 at the Waldorf-Astoria, N. Y. City, and reported record attendance of 1,900. This year, in keeping with the times, the mood of the banquet was nationalistic, a point which was stressed by S. B. Penick Jr., who introduced the speaker of the evening, Hon. Claude Pepper, U. S. Senator from Florida.

The usual gayety followed the dinner as members and guests visited various suites in the hotel engaged by member companies for the occasion.

On this, and the two following pages, C.I. presents some photos taken at the event.

1

(1) L. A. Kolker, Elko Chemical Works, Inc., and W. J. Kramer, Philipp Brothers, Inc. (7) Frank J. McDonough, N. Y. Quinine & Chemical Works, Inc. (8) Joseph B. Magnus, Magnus, Mabee & Reynard, Inc., and C. C. Concannon, Chief, Chemical Division, U. S. Dept. of Commerce. (9) David L. Kaltman, D. Kaltman & Co., Inc.

7

2

8

(2) C. V. Douglass, George Chemical Co., and H. P. Smith, George Chemical Co. (3) (Left to right) E. L. Watkins, Eli Lilly & Co., H. F. O'Meara and J. M. Murphy, J. L. Hopkins & Co., Inc. (4) R. C. Watson, Firmenich & Co., and E. R. Ellis, same company. (5) Dr. E. Meyer and Vernon R. DaCosta, L. Sonneborn Sons, Inc. (6) William M. Stieh, F. W. Berk & Co. and Frank Fanning, N. I. Malmstrom & Co. (10) C. N. Waterman, H. Kohnstamm & Co., Inc. (11) George M. Dunning, Michigan Alkali Co.

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9

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Sharples TRIETHYLAMINE

SHARPLES TRADE MARK CHEMICALS

SPECIFICATIONS

Color	Water White
Spec. Gravity at 20°/20°C.	0.73
Triethylamine Content	Not less than 98.5%
Distillation:	
Initial Boiling Point	Not below 85°C.
Final Boiling Point	Not above 91°C.

OTHER PROPERTIES

Pounds per Gallon	6.1
Flash Point (Open Cup)	20°F.
*Refractive Index at 20°C.	1.4003
*Melting Point	−114.8°C.
*Critical Solution Temp. (in H_2O)	18°C.
*Heat of solution in H_2O	10,040 cal./mol of solute at infinite dilution
*Dissociation Constant	6.4×10^{-4}
Soluble in most common organic solvents	

* Literature Values

Triethylamine is miscible in all proportions with water at temperatures below 18°C. However, if the aqueous solution is heated above that temperature, the solubility falls off rapidly with the result that the clear solution becomes turbid and separates into two layers.

Triethylamine may be used in the synthesis of quaternary ammonium compounds, special types of which are useful as textile assistants.* It is also of interest as a stabilizer for certain chlorinated hydrocarbons.**

Many of the possible commercial applications for Triethylamine are not yet fully developed because it has been available commercially only a comparatively short length of time.

Sharples will welcome the opportunity of cooperating with those who may be interested in Triethylamine either as a possible solution to an old problem or for an entirely new application.

*British Pat. 502,517

**U. S. Pat. 1,925,602

SHARPLES CHEMICALS INC.

PHILADELPHIA CHICAGO NEW YORK

(1) Michael J. Healy, Naugatuck Aromatics. (2) Fred J. Hall, E. E. Dickinson Co. (3) J. J. Hecker, Gillespie-Rogers-Pyatt Co., Inc. (4) John L. Newkirk. (5) Lt. D. Calo, Chemical Warfare Service. (8) Paul Mayfield, Hercules Powder Co., and George Brownhill, E. I. du Pont. (9) (Left to right) Fred J. Richter, L. Sonneborn Sons, Inc.; Don Sheppard, Chas H. Phillips Chemical Co., and F. W. Griffith, L. Sonneborn Sons, Inc. (10) (Left to right) J. A. Kilcommons, Woonsocket Color & Chemical Co., Ralph E. Dorland, Dow Chemical Co., and Frank G. Prue, Woonsocket Color & Chemical Co.

(6) (Left to right), R. L. Hutchins, Commercial Solvents; R. C. Estabrook, C. E. Jamieson; Jeff Snyder, Commercial Solvents; and F. L. Wachter, Eastern Box Co. (7) (Left to right), Frank Forrest, radio star of "Double or Nothing"; F. V. Canning, Sweets Laboratories; K. A. Bartlett, White Laboratories; and Paul Canning, Sweets Laboratories. (11) (Left to right), Harold W. Feuchter, R. A. Clark and C. H. Slater, J. T. Baker Chemical Co. (12) Bill Neuberg and his associate, David F. Birch, William D. Neuberg Co. (13) E. F. Bertrand, Owens-Illinois Glass and Joseph A. Gallagher, Jeris-Herpicide.

But NOT TOO BUSY to maintain our high standards

In these hectic days there's a lot of mad scrambling to get things done. We, too, are rushed and making a valiant effort to keep up with our schedules.

But, busy though we are, there is no let-up in our standards. We're as fussy as ever about our products being RIGHT. ISCO Production is still laboratory-controlled and, just as in times less strenuous, you may rest assured that Industrial CHEMICALS, GUMS, WAXES and RECOMMENDED SUBSTITUTES you buy under the ISCO Trademark will be of the same high standards you have known so long.

To jog your memory of what the ISCO Lines include of your requirements, ask us to see that the ISCO News is mailed you regularly.

ISCO

ISCO CAUSTIC POTASH
Solid • Flake • Granular
Broken
Walnut-size pieces for special purposes
Liquid 45% KOH, also 50% strength

ISCO CARBONATE OF POTASH
Hydrated 83/85% • Calcined 98/100% • Liquid 47/48%

ISCO CHLORIDE OF LIME
(Bleaching Powder)
35/37% free flowing

ISCO FERRIC CHLORIDE
(Iron Chloride)
Grades for every Industrial purpose

ISCO FERRICLOR
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Designed especially for Sewage and Water Treatment

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Industrial Chemicals since 1816

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75 YEARS OF SERVICE TO CHEMICAL USERS

Congress, under a joint Resolution of July 27, 1866, provided that each of the states be furnished with a complete set of weights, running from 10 kilograms to 1 milligram . . . unvarying throughout the states.

Unvarying Standards

As unvarying as Government standards . . . are the standards which rule the manufacture of Mallinckrodt Chemicals. Potentiometer, centrifuge and flask—the most modern scientific equipment available, in the hands of capable technicians—certify the potency, purity, and uniformity of Mallinckrodt Chemicals for medicine, pharmacy, industry, laboratory and photography.

With the experience of 75 years of manufacture of fine chemicals as a guide . . . and a better knowledge of the requirements of each type of chemical user . . . Mallinckrodt Chemical Works stands ready and able to offer even superior service in the years to come. Research continues to be a fundamental Mallinckrodt policy. As in the past, our laboratory workers will continue to improve available chemicals and to add new, valuable products to the Mallinckrodt list of over 1,500 useful chemicals.

FINE CHEMICALS Mallinckrodt SINCE 1867

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Serving Chemical Users for Seventy-five Years

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NEWS OF THE MONTH

COMPANIES

All Out for War

SUSPENSION for the duration of the war of the 40-hour week, patent laws, anti-trust laws and adoption of a firm attitude by the administration on such controversial issues as the closed shop and the check off to permit unhindered pursuit of the war production program were advocated last month by Edgar M. Queeny, president of Monsanto Chemical Co., at the annual meeting of Monsanto stockholders in St. Louis.

His comments were made in answer to a question put by a stockholder from the floor.

He stressed in his answer that the 40-hour week has not as yet hampered Monsanto construction or operation even though the company's plants have operated around the clock, seven days a week for years.

He said, however, that the limitation on hours had increased the cost of construction and in some cases the cost of operation. But, he said, these additional costs have been borne largely by government, either because government is paying for plants or because the extra production costs caused by overtime payment have reduced profits which, in turn, have reduced the company's federal tax contribution to the extent of 72%.

He stated payment of Saturday and Sunday overtime in construction could be considered justifiable in peacetime when the inconvenience of Sunday or holiday work should be compensated, but he questioned the justification of such payments under the stress of the present urgent situation when facilities are sorely needed by the nation.

New Aniline Set-up

Directors of General Aniline & Film Corp. at a special meeting last month voted to carry out the reorganization of the management and directorate of the company as suggested by Henry Morgenthau Jr., Secretary of the Treasury. The new set-up makes Robert E. McConnell, chairman of the Engineers Defense Board, the executive officer of the company.

Judge John E. Mack, who was elected president of the company on Oct. 31, resigned to make way for Mr. McConnell and the new five-man board which will assume full responsibility for the management of the company. Four of the new directors were chosen, but the fifth director, it was announced, will be chosen later. All twelve directors of the firm also resigned.

The new directors chosen are Robert E. Wilson, president of Pan-American Petroleum & Transport Co.; A. E. Marshall, president of Rumford Chemical Works, of Rumford, R. I.; George Moffett, chairman of Corn Products Refining Co., and Mr. McConnell.

Hercules Fellowship

Hercules Powder Co. announced last month the establishment of a fellowship, to be known as the Pine Chemicals Fellowship, at Mellon Institute of Industrial Research at the University of Pittsburgh for the year 1942. Dr. George B. Feild of the Institute will be the fellow.

The purpose of the fellowship will be to develop new uses for rosins, and will emphasize applications of these materials in the war effort. The fellowship continues the company's policy of expanding the uses of naval stores products, turpentine, pine oil, and rosin, and the products which may be derived from these basic chemical materials.

Record Sulfur Year

Freeport Sulphur Co. in 1941 shipped the largest tonnage of sulfur in its history and, through its subsidiary in Cuba, the largest tonnage of manganese, Langbourne M. Williams, Jr., president, stated in the annual report.

Although the company was called upon to supply a new record total of sulfur, he reported that "production was increased to keep virtually abreast of increasing shipments with the result that there was no substantial reduction in our above ground stocks of mined sulfur, which are sufficient to last well over a year at the 1941 rate of sales."

Freeport's manganese subsidiary, Cuban-American Manganese Corporation, Mr. Williams said, expanded its Cuban plant approximately one third and conducted an ore-buying program to stimulate small-scale miners there. "As a result," he said, "the Company was able to ship a total of 190,000 tons of ore to the United States, about 40 per cent more than ever before."

Defense Plant Corp. and Metals Reserve Co. have entered into agreements with Freeport Sulphur Co. whereby $20,000,000 will be made available for production of nickel in Cuba.

Holm Gets Borden Prize

The Borden Co. prize of $1,000 for outstanding research in the chemistry of milk has been awarded for 1942 to Dr. George E. Holm, biochemist of the Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C. The award will be presented at the 103rd meeting of the American Chemical Society, which will be held at Memphis, Tenn., April 20 to 24.

Dr. Holm is honored for "his contributions to the understanding of the basic causes and the control of oxidative deterioration of fats and oils, and to the prevention of spoilage of dairy products caused by the oxidation of milk fat."

Penn Salt Staff Up

Pennsylvania Salt Manufacturing Co., Philadelphia, has increased the staff of its industrial cleaner division by 65% to cooperate in solving the critical problem posed by the War Production Board's recent warning to industry to use other than chlorinated solvents in metal cleaning operations.

Antimony Described

A story about antimony appears in the April number of *Priorities*, House Magazine of Prior Chemical Corp. The point is made that this metal is little more than a name to most people despite the fact that it has been employed since very ancient times and is today on the list of strategic materials under strict Government control.

Record Sales

A new high record in sales, mostly to meet demands of national war effort, was announced last month by William P. Witherow, president of Blaw-Knox Co., Pittsburgh, in his 1941 report to stockholders.

Aniline Fellowship

The establishment of a $1000 fellowship in organic chemistry at the University of Texas by the General Aniline and Film Corp. was announced here last month.

GOVERNMENT

That Fertilizer Case

Judge Johnson J. Hayes last month imposed total fines aggregating $259,852 in Federal court, Winston-Salem, N. C., on 102 concerns and individuals in the fertilizer industry charged with price-fixing and restraint of trade.

The fines ranged from $9,000 in the case of the largest firms involved to a minimum of $2. No other punishment was given.

On plea of defense counsel, fines of $9,000 each against the International Agricultural Corporation and the Baugh group

of companies were reduced to $8,000. A request for reduction in the Davison Chemical Corporation fine of $9,000 was denied.

Other companies fined were as follows: The National Fertilizer Association, Inc., $9,000; the American Agricultural Chemical Co., $9,000; Armour & Co. of Delaware and Armour Fertilizer Works, Inc., $9,000; F. S. Royster Guano Company, $9,000; Swift & Co., $9,000; Virginia-Carolina Chemical Corporation, $9,000.

The defendants who were nol-prossed are: Arkansas Fertilizer Company, F. W. Tunnell & Company, Inc., Harold F. Ayer, John F. Maybank, A. Quistgaard Petersen, E. H. Westlake, and George A. Whiting. In addition to these the Court imposed no penalty upon Charles J. Brand, Executive Secretary of The National Fertilizer Association, saying that there was no evidence to indicate any intention whatever on his part to violate the law in letter or spirit.

Among industry practices under attack were the exchanging of price schedules and port basing-point prices. It was pointed out to the Court that Government publications show that these practices are nothing new in the industry but have been in existence for many years.

The settlement of the suit did not include entry of any consent decrees as to future business practices in the industry.

Minimum Wages Set

Secretary of Labor Frances Perkins last month established minimum wages in the chemical and related products industry effective April 28, at the following scales: (1) 40 cents an hour or $16 a week of 40 hours for Maryland, Virginia, North Carolina, South Carolina, Tennessee, Arkansas, Mississippi, Alabama, Georgia, Florida and the District of Columbia. (2) 50 cents an hour for the remaining states.

Her determination was made after consideration of all the facts and circumstances in the case. A wage survey tabulated by the Research Section of the Division of Public Contracts was produced at a public hearing and it was upon this and other evidence that the recommendations were based. An opportunity was given to show cause why the rates established should not be put in effect and only one protest was received in response.

New Wrinkle Case

The U. S. Court at Buffalo, N. Y., last month rendered a decision in the case of New Wrinkle, Inc., Dayton, O., owner of patents on Wrinkle Finishes widely used in industry, upholding the validity and infringement of these basic patents. The case was defended by the Pontiac Varnish Co., Pontiac, Mich., a manufacturer of varnishes and enamels. It was found that Wrinkle Finishes were broadly new as covered by the patents in suit.

New Wrinkle, Inc. was represented in this case by Toulmin & Toulmin, Dayton, O., as General Counsel and Mr. Frederick S. Duncan, N. Y. City as Associate.

The Court decision prevents the Pontiac Varnish Co. from any further infringement of the patents in suit.

ASSOCIATIONS

ACS Meeting

Utilization of agricultural products of the South will be the theme of a symposium to be held by the Division of Agricultural and Food Chemistry of the American Chemical Society in connection with the Society's 103d national meeting at Memphis, Tenn., April 20 to 24.

Developments in the cotton, tobacco, and peanut industries through the application of scientific research will be reported in fourteen papers before the Division on Wednesday, April 22. Dr. E. H. Harvey, director of research of Anheuser-Busch, Inc., St. Louis, and chairman of the Division, will preside.

A symposium on "Vitamins" will be held jointly by the Division of Agricultural and Food Chemistry and the Division of Biological Chemistry on Tuesday morning, April 21. Dr. Ben H. Nicolet of Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C., chairman of the Biological Division, will preside.

Packaging Conference

Factual analysis of measures that have been taken by various companies to adjust their operations to the most critical of problems in packaging, packing and shipping—that of shortages in basic materials—will be presented at the 12th annual Packaging Conference of the American Management Association, to be held concurrently with the 12th Packaging Exposition at the Hotel Astor, New York, April 14 to 17, inclusive.

The conference program will center about measures successfully employed to align packaging activities with the war-created problem of existing and impending materials shortages. Major emphasis will be placed on "case stories" relating the experience in this direction of a wide variety of companies.

Evans Gets AIC Medal

Medal of The American Institute of Chemists, presented annually for outstanding service to the science of chemistry and to the profession of chemist in America, will be awarded this year to Dr. William Lloyd Evans, chairman of the Department of Chemistry and professor emeritus of Ohio State University, Columbus, O.

The award is made in recognition of Dr. Evans' outstanding accomplishments in the field of oxidation of organic compounds, particularly in the oxidation of carbohydrates; and for his contributions to the profession as an educator.

The medal will be presented to Dr. Evans at the Annual Meeting of The American Institute of Chemists to be held on May 16, 1942, at the Claridge Hotel, Atlantic City, N. J.

Juniors to Meet

Seventh meeting of the year for the Junior Chemical Engineers of New York will be held April 17 at Childs Restaurant, 12 E. 59th st., N. Y. City. Dinner will be served at 6:00 p. m. and the meeting will start at 8.

Topic of the evening is "The Axis and Its Oil Supplies" which will be discussed by Dr. Robert E. Wilson, president, Pan-American Petroleum & Transport Co.

Salesmen and Priorities

Priorities, price ceilings and allocations will be discussed at a meeting of the Salesmen's Association of the American Chemical Industry, to be held in the Chemists' Club, New York City, April 16. Speakers will include members of the Chemical Salesmen's Association now serving in Washington with various units and sections of the WPB and the OPA.

Meeting is scheduled to start at 8 p.m. and will be preceded by dinner at 7 p. m. Arrangements and reservations are in charge of Charles F. Alexander, Seldner & Enequist, Inc., chairman of the entertainment committee of the Association.

Headquarters for A.I.Ch.E.

Hotel headquarters for the annual meeting of the American Institute of Chemical Engineers to be held in Cincinnati Nov. 16 and 17 will be the Netherland Plaza. Previous reports had set the locale in the Hotel Statler.

Druggists Indicted

The National Association of Retail Druggists, the New Jersey Pharmaceutical Association, 13 local and county pharmaceutical associations in New Jersey and 15 of their officers and agents were indicted by a Federal Grand Jury in Newark, N. J., March 26, charged with conspiracy to violate the Sherman Anti-Trust Act.

Conspiracy, according to the charges, involved an arrangement to fix retailers' margins of profits on drug store items.

Reid to Speak

Dr. Ernest W. Reid, chief of the chemical and allied products branch of the WPB, will speak at a luncheon of the Drug, Chemical and Allied Trades Section of the N. Y. Board of Trade, at the Hotel Pennsylvania, N. Y. City, April 24. Luncheon will begin at 12:30 p. m.

PERSONNEL

Newhall Appointed

Arthur B. Newhall, chief of the Rubber and Rubber Products Branch of the WPB, has been named Coordinator for Rubber by Donald M. Nelson. He has been given sweeping powers to direct and integrate all current programs dealing with the use, control or production of natural and synthetic rubber.

Bezanson a Vice-President

Osborne Bezanson, general manager of the Texas Division of Monsanto Chemical Company, was elected a vice-president of the company recently. All other officers were re-elected.

Rosenstein With General

Dr. Ludwig Rosenstein, formerly with the Shell Chemical Co., is now associated with General Chemical Co.

Olsen Sales Manager

James F. Olsen has been appointed sales manager of the Turbo-Mixer Corp. succeeding Gordon MacLean who has joined Allied Molasses Corp. as technical director.

Latham With CWS

Lt. Henry H. Latham, formerly plant manager of Chemical Processing Co., Charlotte, N. C., is now on active duty with the Chemical Warfare Service at Edgewood Arsenal, Maryland.

Ott on Cellulose

Dr. Emil Ott, Director of Research of Hercules Powder Company, spoke last month on "The Chemistry of Cellulose and Cellulose Derivatives," at Western Reserve University, Cleveland.

Gutman With Navy

Alfred E. Gutman, formerly with National Starch Products Inc., is now doing chemical engineering work for the Naval Ordnance Laboratory, Washington, D. C.

Bennett in C. A.

H. Bennett of Crowley & Bennett, technical consultants, left recently by plane for Cuba, Mexico and Guatemala. He is visiting various chemists, educators, public officials and industrialists there in connection with native industries and their relations with the United States during the war. He will return on or about May 22nd.

New Quaker Chemists

New additions to the research laboratory staff of Quaker Chemical Products Corp. are:

Allan d'Apery Mills who has joined the laboratories in the capacity of organic research chemist. Mills was previously associated with the Rohm & Haas Co. for five years. J. Perzanowski has joined as an organic chemist. He was formerly connected with the laboratories of the United Gas Improvement Co. Miss Ruth Smock, a graduate of Temple University, has been employed in the control laboratory.

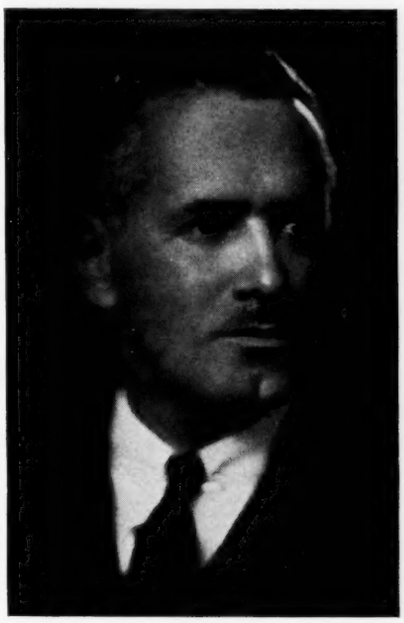
Vail to Speak

James G. Vail, vice-president of the Philadelphia Quartz Co. and former vice-president of the A. I. Ch. E., will be the speaker at the annual meeting of the Rose Polytechnic Institute Student Chapter of the A. I. Ch. E. Meeting will be held at the Terre Haute house April 24.

Steck a Vice-President

L. V. Steck, formerly assistant director of the Shell Development laboratories, has been appointed vice-president in charge of marketing of the Shell Chemical Co., San Francisco.

George Goes to Hooker



William F. George, associated with CHEMICAL INDUSTRIES for many years has joined the sales organization of Hooker Electrochemical Co. This company has its principal offices at Niagara Falls, N. Y. Mr. George will be in charge of the New York office at 60 E. 42d st. He will devote his efforts generally to trade contacts in the metropolitan New York area.

At one time he was connected with Hooker in the Niagara Falls plant and later in the New York sales office. He left in 1919 to organize the firm of W. F. George Chemicals, Inc., now known as George Chemical Co. which business he conducted until 1928 when he went with CHEMICAL INDUSTRIES.

Gets Medal

Reno H. Sales, chief geologist, Anaconda Copper Mining Co., Butte, Mont., will be awarded the 1942 Egleston Medal of the Columbia University Engineering Schools Alumni Association for distinguished engineering achievement. Presentation will be made April 23 at the 71st annual dinner of engineering alumni at the Columbia University Club, N. Y. City.

Brooks Helping in Mexico

Dr. Benjamin T. Brooks, a member of CHEMICAL INDUSTRIES' consulting editorial board and a well-known consultant, is assisting Morris L. Cooke in the settlement of the dispute between the Mexican Government and American oil interests in Mexico.

More Personnel

Dr. Paul D. Peterson has been appointed Director of Agricultural Research for the Freeport Sulphur Co. to head the company's development of new agricultural uses of sulfur.

Robert E. McConnell, new president of General Aniline & Film Corporation has announced the appointment of **Joseph S. Bates** as vice president in charge of production for General Aniline division of the company.

Dr. William Frederick Zimmerli has been appointed vice president in charge of research and patents of General Aniline & Film Corporation.

Robyn M. James has recently joined the bacteriological staff of Commercial Solvents Corp. and is now working at the research laboratories in Terre Haute, Ind.

J. O. Small, formerly vice-president and technical director of the Arco Co., Cleveland, has joined the Synthetics Department of Hercules Powder Co., Wilmington, Del. He will be engaged in technical development work in the use of synthetic resins and rosin esters, particularly in their application to war materials.

The Devoe & Raynolds Co. has announced the appointment of **William J. O'Callaghan** as Sales Manager of the Marine Division to succeed the late **Harry C. Shedd.**

Maurice Rosenblatt, head chemist of the Schenley Research Institute, N. Y. City, has been named an associate referee of the Association of Official Agricultural Chemists.

Lieut. Donald E. Neese, a chemist for R. B. H. Dispersions, Inc., has reported to the Chemical Warfare Service, Edgewood Arsenal, early this month.

James W. Martin, consulting engineer of N. Y. City, has given up his practice for the duration of the war to accept a position with Sanderson and Porter as Chief Engineer on the construction of an arsenal in Arkansas.

George P. Torrence, chief engineer of Industrial Rayon Corp. and vice-president and general manager of its subsidiary, Rayon Machinery Corp., has been named Chief of the Materials Disposition Section of the Inventory and Requisitioning Branch of the War Production Board.

J. D. Van Valkenburgh has been appointed assistant to the president of Irvington Varnish & Insulator Co., Irvington, N. J. For the past several years he has been associated with the Johns-Manville Corp., N. Y. City.

GENERAL

Mathieson Ammonia Plant

Mathieson Alkali Works, Inc., recently completed a contract with the Defense Plant Corporation for the immediate construction of a plant to produce ammonia synthetically through use of a modification of existing methods. DPC will finance the plant which Mathieson will erect and operate.

Powder Metallurgy

A course in Powder Metallurgy began early this month at the College of the City of New York under the direction of Engineering, Science and Defense Management Training. W. J. Baëza is giving the course which runs for 10 weeks, two nights a week from 7 to 10:30 p. m.

No tuition or other fees are required and application for the course may be made to the director at the College.

Chemists Needed

U. S. Civil Service Commission is still looking for research chemists and technologists and has recently issued two announcements with modified requirements. Applications and information may be had from the commission's Washington office or from your post office, if it's first or second class.

Mining Bauxite

Active mining of domestic bauxite has been begun by a subsidiary of the Reynolds Metals Co. Bauxite from Arkansas deposits, now being mined by the Reynolds Ore Co. is shipped to the Alabama aluminum plant of the Reynolds Metals Company, where it is turned into the light weight metal. Original shipments of bauxite for the Reynolds plant came from the Netherlands East Indies.

OBITUARIES

A. B. Davis

A. Brooking Davis, president of the Hilton-Davis Chemical Co., Cincinnati, O., died March 11 at Christ Hospital, Cincinnati where he had been a patient since Dec. 31. He was 59.

E. J. Dunne

Edward J. Dunne, in close contact with the chemical, paint and food industries for many years as an expert in the steel drum and wooden barrel industry, died April 2 of a heart attack. He was associated with Acme Steel Drum Co., Inc., and in addition to being a pioneer in the reconditioning of steel drums was a valuable contributor to the development of this industry.

F. G. Small

Fred Glen Small, 50, owner of the New York advertising agency bearing his name, died at his home in Rockville Centre, N. Y., March 24, after a brief illness.

M. R. Dinkelspiel

Dr. M. R. Dinkelspiel, associate editor of the Merck Manual of Therapeutics and Materia Medica and a medical writer in the advertising department of Merck & Co., Inc., died March 13 at the age of 67.

C. W. Lotte

C. Walter Lotte, president of the Lotte Chemical Co., died March 20 at the age of 47.

B. L. Maltbie

Birdsey L. Maltbie, once a prominent figure in the pharmaceutical field, died March 24 at his home in Altamonte Springs, Fla., after an illness of seven months. He was 77.

F. D. Dodge

Francis D. Dodge, chief research chemist of the Dodge & Olcott Co., died March 14 of a heart ailment at the age of 74.

BETWEEN THE LINES

(*Continued from page 490*)

ing 18-inch or even larger guns, in place of the 14 and 16-inch weapons in use, he runs into this phase of the matter, without knowing any of the complications.

The Navy's gunnery officers, of whom no Navy in the world has any better, have in the course of years of target practice at sea, worked out precise firing data for the powder in use, and it is reasonable to believe, for the respective lots that are taken aboard from time to time.

Any radical change in the size of a naval vessel's armament therefore, involves new computations as to powder charges effective for different conditions, and other factors that a politician in love with big figures just for their sound in print, seldom realizes. The same principle applies to powder charges used in land artillery of particular purposes; coastal guns, for instance.

In fact, it is axiomatic with peace-time consumers of smokeless and forms of this type of powder, for target use, etc., that not only do individual lots of powder vary, but differ also in their performance in individual guns. They differ, furthermore, in the conditions under which they are used. Great heat, as in the tropics, has a tendency to increase the explosive effect of the propellant, dampness is a factor, and in short, the chemical properties of explosive powders are an involved study in themselves.

Under war conditions it is doubtful if the artillerymen on land, or the gunners at sea, will have much opportunity, as time goes on, for the refinement of study of these matters that is possible in the leisure of peace. The infantryman, firing an automatic rifle at 8 shots a clip will have little time, under present conditions, for any great technical appraisal of the performance of the lots of cartridges from which he draws his bandoleers—what he, and other services will be interested in primarily is that they get lots of cartridges when they are needed, and where.

In addition to the propellant smokeless, the services will use vast quantities of trinitrotoluene, popularly termed TNT, which is composed of toluol, a liquid derived from either coal or petroleum, and our valued aid, nitric acid, once more.

It has peculiar properties, such as a superficially good disposition, meaning that unless badly jarred under specific conditions, it is safe to handle, as explosives go. When set off, however, the results are decidedly unsafe.

In use during peace, as a thinner for lacquers and other coatings, the country's toluol output was reasonably adequate, but it is now to be put out in quantities limited only by capacity. If there were enough TNT, it would meet every high-explosive requirement of the nation. As there is not enough, even from augmented

supplies from petroleum, as a by-product of coke ovens, and as a by-product of aviation gas, a supplementary explosive was needed.

Once more using nitric acid with ammonia, the result is ammonium nitrate; the ammonia in gas form, which in the end product is a saltlike crystalline matter. One combination in use for military purposes is mixed with TNT.

Considering such demands, and that not only the tremendous needs of this country, but of associated nations in the war, must be met partly at least from American industry, the reasons should be apparent for the new glycerine curtailment, and those affecting coke, toluol, and other elements entering the current production program.

CHEMURGY'S OPPORTUNITY

(*Continued from page 517*)

belt contains only about 736,000 acres of land suitable for growing the tree, so at present approximately one-third of all this suitable acreage is planted. Very few of these plantings have attained maturity, nor were all of them so well planned and managed that they will produce bounteous crops."

However there are several larger organizations which are developing orchards that are expected to soon result in considerable production and create an important American tung industry.

Cull Potatoes for Starch

Mr. R. E. Gale, General Sales Manager of the Idaho Power Company showed in a concrete way how the National Farm Chemurgic Council can be of help. In considering farm products and wastes in Idaho, it was found that cull white potatoes rank about first in tonnage. For this reason the National Farm Chemurgic Council suggested, even before the Idaho Committee had been officially formed, that these culls be investigated by a group of local men. This group asked the Council for a report on the manufacture and marketing of white potato starch. While this report was being prepared the local group proceeded with a survey of the potato production in Idaho and Eastern Oregon.

The problems were discussed with growers and shippers while making the survey and they manifested a great deal of interest in the possibility of obtaining starch plants for their various communities.

After a preliminary report was received from the National Farm Chemurgic Council a detailed study was made of the potato producing centers where production was concentrated in a compact area. From this survey it was decided that Blackfoot and Twin Falls should be the locations of two starch plants.

The Idaho group then obtained the services of Mr. W. R. Richee of Stein, Hall and Company who inspected and approved existing building facilities, gathered data and drew up plans for two starch plants.

When this information was completed the Idaho group attempted to get financial backing from Eastern interests but was unsuccessful. Therefore, the plan was put up to local people who agreed to finance the factories. The stockholders include merchants, doctors, lawyers, bankers, farmers, produce men, school teachers and people from all walks of life.

The Magic Valley Processing Company was formed at Twin Falls and the Idaho Potato Starch Company at Blackfoot.

After much difficulty in procuring equipment and the application of ingenious makeshift methods in adapting available machinery for special equipment that could not be had, the plants finally were ready.

The first batch of starch was turned out on October 23 at the Blackfoot plant, while the Twin Falls plant got into operation about a week later. Each plant has a maximum capacity of 15 tons per day, but will normally produce 10 tons of white potato starch per day and about 16 tons (70%) of potato pulp for stock feed.

Mr. Gale concluded his report with, "For this reason we believe that the application of one of the first principles of the National Farm Chemurgic program (namely, "More economical use of farm byproducts and wastes") to one of the principal farm crops of Idaho has resulted in the establishment of a new industry for

ZIRCONIUM
for industry
Today, Defense and non-defense manufacturing has emphasized the ever-increasing uses and possibilities of the element ZIRCONIUM and its compounds in industry. TAMCO Zirconium compounds are being used successfully in the manufacture of Refractories, Electrical Resistors, Resins, Dye Extenders, Water Repellents, Catalysts, Abrasives, and Ceramics.
TAMCO'S development engineers and research laboratories have long been cooperating with the industry. Write today, for a TAM resident field engineer to call at your plant and discuss the potential use of Zirconium Compounds with you.
TITANIUM
ALLOY MANUFACTURING COMPANY
TAMCO PRODUCTS INCLUDE
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Zirconium Tetrachloride
Zirconium Sulphate
Zirconium Nitrate
Zirconium Stearate
Zirconium Palmitate
Zirconium Carbide
Zirconium Cyanonitride
Zirconium Silicates
Zirconium Double Silicates
Zirconium Oxides
Zirconium Metal
Zirconium Silicate Refractories
Zirconium Silicate Cements
Zirconium Oxide Refractories
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Representatives for the Pacific Coast States . . . . L. H. BUTCHER COMPANY, Los Angeles, San Francisco, Portland, Seattle
Representatives for Europe . . . UNION OXIDE & CHEMICAL CO., Ltd., Plantation House, Fenchurch St., London, E. C., Eng.

the state and that this new industry will be an important factor in keeping the Idaho potato grower in business."

Flax Fiber Development

Harry H. Straus, president of Ecusta Paper Corp. reported on the success of domestic production of cigarette paper from flax. Before the war practically all cigarette paper used in this country was imported from France, made from discarded linen rags.

Mr. Straus reported: "It happened that on September 2, 1939, the day war was declared, we turned out our first carload of American made cigarette paper, and if it was not for Ecusta, it is quite likely that the cigarette smokers here—and I am sure they represent the great majority —would be denied this enjoyable smoke."

Other Topics Discussed

Among the other papers presented at the conference which we do not have room to discuss here were: Food, Farm Machinery and War by Fred A. Wirt, Agricultural Engineer of J. I. Case Company; Plastics in War Time by J. H. Du Bois, General Electric Co.; Corn Products for War by W. B. Newkirk, Corn Products Refining Co.; On Common Ground by Carroll L. Wilson, Director, Bureau of Foreign and Domestic Commerce, who made a plea for greater production; Drying Oil Requirements for Defense by Ernest T. Trigg, president, National Paint, Varnish & Lacquer Association; The Challenge of War Economy by Dr. M. C. Teague, Director, New Products Investigations, United States Rubber Co.; Farm and Factory in the War by Warren W. Shoemaker, Vice-President, Armour and Co.; Southwestern Chemurgic Progress by Victor H. Schoffelmayer; Modern Plastics by Dr. M. H. Bigelow, Director of Technical Service, Plaskon Company, Inc.; The Tanning Industry as It Is Related to Farm Chemurgy by August C. Orthmann, President, Orthmann Laboratories, Inc.; Insecticides and Fungicides by J. R. Hile of the Agricultural Insecticide-Fungicide Association; Drug Plants for Pharmaceutical Alkaloids and Extracts by Dr. Franklin J. Bacon, Professor of Botany and Pharmacognosy, Western Reserve University; Recent Castor Bean Developments by Dr. W. L. Burlison, Head, Department of Agronomy, University of Illinois; Soybean Developments in the Midwestern States by George M. Strayer, Secretary, American Soybean Association; Recent Progress of the U. S. Regional Soybean Laboratory by J. L. Cartter, U. S. Regional Soybean Industrial Products Laboratory; Chemurgy in a Career by M. F. Taggart, Director of Research, O'Brien Varnish Co.; and A Glimpse of the Future by L. F. Livingston, Manager of the Agricultural Extension Division, E. I. du Pont de Nemours & Co., Inc.

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

A LOT of people who call this office for one speck of information or another about the chemical market ask the same question in closing, "What is the situation going to be like a year from today?" This nervous Nostradamus never knows quite what to say to this one and the best answer to give is usually "If I knew the answer to that one I'd be such and such etc." or "Who can say?" or just plain "yuk, yuk you sure are a card with your funny questions." Most of the time it works, for who knows and who can say?

However, this rheumy reporter is going out on a limb this month to tell you in no uncertain terms just what is going to happen in the chemical industry this year. Private pipelines to usually unreliable sources of information are my only backing so don't get excited if I go haywire. If I'm wrong, I'll apologize.

The year 1941 was the most active one in the history of the chemical industry. This year will prove to be even more active *but* only to the extent that increased production can be expected from new plants and conversions. Existing facilities are taxed to the utmost and increased production from what we have is practically impossible. All the large civilian users of chemicals—fertilizer manufacturers, pulp and paper, glass, petroleum products, paints and varnishes, iron and steel, textiles—operated at record levels last year and will continue to do so this year. In addition, the military program calls for immense tonnages of explosives. Naturally, if your industry uses a chemical that the explosives industry needs, they get it.

As measured by the Federal Reserve Index, production of basic and subsidiary chemical products advanced more than a fourth. It might do the same thing this year; if materials hold out. Output of sulfuric acid rose to around 6½ million tons last year compared with the previous record in 1940 of 5.4 million. You may see another new high established this year . . . if all industrial production levels reach the figures set by the War Production Board, it can't miss. Chlorine production was 13% heavier in 1941 than in 1940. Another increase should be noticed this year though perhaps not as much as the previous one. Gain in soda ash was roughly 10% in 1941; in 1942 it should gain slightly more.

In spite of all this expansion in 1941 (and this goes for 1942, too) there were severe shortages in many chemicals, as you all so well know. Many industries had to make changes in processes—metals, paper and pulp, textiles and metallurgy—and many more will follow this year. Let down in production of civilian goods will affect many chemicals.

Our newly-planned synthetic rubber industry which has a goal of some 700,000 tons will need tremendous quantities of chemicals and equipment. If you've got anything they need, let 'em have it, will you? My tires are worn to so many ribbons that anyone standing within 10 feet of my car gets a thorough whipping when I pass.

While we're on the subject, when you read all this business about synthetic rubber in the newspapers and why we haven't got hundreds of plants putting the stuff out and how so and so didn't do this and such and such a company didn't do that, don't be too willing to blame the rubber industry. This reporter happens to know that the blame isn't all industry's; the clampdown came from much much higher up and the word was "lay low on the synthetic rubber production . . . it might offend the British and Dutch interests." This was before we got into the war, of course, but let's get that part of it straight. And if you ask this department, Standard Oil isn't quite the scapegoat the government is trying to make it appear. Seems to me that Standard tried for quite some time to interest government and industry alike in synthetic rubber production but its plans were pooh-poohed. Let's be fair about this thing, huh?

Some of the things the government did recently that affect the chemical industry are listed here: Operation of conservation action on methyl alcohol facilitated by amendment; Complete allocation of antimony, lead and tin alloy ordered; chemical industry may use preference ratings to obtain drums, containers and other packaging; Use of chlorinated hydrocarbon solvents extended until May 15—conservation of chlorine products postponed to May 1; Civilian use of organic dyestuffs restricted; Allocation of all glycerine deliveries over 50 pounds; Production of laboratory equipment and reagent chemicals extended until June 30; Reagent grade of oxalic acid exempted from revised price schedule 78; Maximum margins established for mixers and dealers sales of sodium nitrate, ammonium sulfate and cyanamid to farmers; General

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preference order to conserve the supply of rapeseed oil; General preference order restricting the consumption of high lauric acid oils (coconut, babassu, palm kernel and all others having lauric acid content of 35% or higher); General preference order further restricting tung oil.

Heavy Chemicals: The government order which restricts production of civilian goods and prohibits new construction will be felt in many branches of the chemical industry. If you have been supplying paints, plating materials, electrical goods, glass or other similar industries with chemicals, you know this already. Export business is still complicated. Stocks of silicofluoride are low, price schedules remain the same though spot prices are higher. New outlets are possible for this chemical. All of the agricultural chemicals are moving out in sizeable volume. Copper sulfate demand is terrific and so much is needed for domestic use that the export inquiries must simply be pushed in the background. Refined sulfur prices are being maintained all around at the higher levels recently established. Many retail products which were marketed in tin containers now are coming out in glass. This is reflected in increased activity in the glass industry to heights never before reached. Shipments of Chilean sodium nitrate continue to arrive in this country and they are all being used to augment the government's stock pile. Most of the allocated material goes right into the manufacture of powder. Sodium acetate and zinc sulfide prices were raised but the expected jump in barium chloride prices so far has failed to materialize. Lead acetate seems to be going out at the same prices as heretofore. General letdown in the rubber industry is having its effect on the chemical industry. It will be a busy season for calcium chloride manufacturers. Price advances have been made because of the higher freight rates. If use of low-grade chrome ores becomes necessary in the future bi-chromate prices may be affected. Sulfur producers in Texas and Louisiana are looking about for new deposits. This country accounted for 2,400,000 tons of the world production of 3,200,000 last year.

Fine Chemicals: Reduction in the price of tetraethyl lead has been announced by Ethyl Gasoline Corp. Reduction in amount of mercury in ointments is expected.

Facilities for production of atabrine, said to be the only substitute for quinine in the treatment of malaria, are being increased 8,000 per cent. above the prewar capacity in this country.

The Reconstruction Finance Corporation announced that 500,000 of the 2,000,000 ounces of quinine that it had bought on the recommendation of the War Production Board had been "lost at sea." This, coupled with the loss of the Netherlands Indies, which supplied 90 per cent. of the world's cinchona bark and its derivatives, has created a serious emergency situation in quinine.

Leo Crowley, Alien Property Custodian, is investigating in conjunction with the Justice Department and the Public Health Service, the Winthrop Chemical Company's alleged monopoly of German patents for the production of the only synthetic substitute for quinine—atabrine.

(Quinine is restricted by order conserving it for military use.)

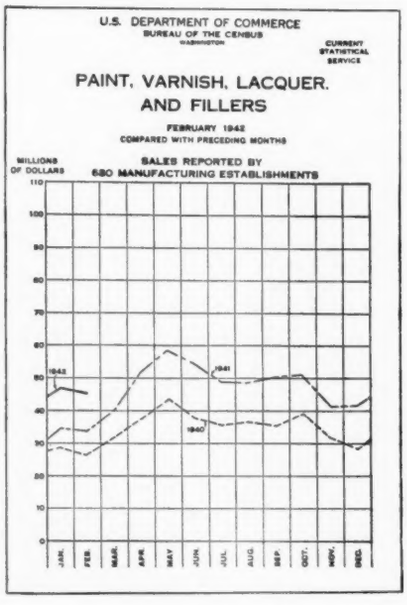
Raw Materials: Mr. Ickes has warned that if private capital doesn't develop the natural resources of this country to win the war the Government will.

Tanners are now more inclined to purchase materials which can replace, even in part, types formerly employed. Domestic production of chestnut, oak, and hemlock extracts is expanding.

Further restrictions on the use of chrome derivatives for tanning will not adversely affect leather production as they would have done a year ago. The industry has made considerable research, and results have been favorable. More efficient use of chrome materials now permits larger production. Furthermore, the use of other materials in connection with chrome actually reduces the amount of the latter now required.

Mangrove extract produced from the bark of Florida mangroves may become an important factor in the domestic tanning-material trade. A survey has been started to determine the feasibility of economic production of mangrove extract in Florida. The Forest Service is collecting, from various parts of that State, samples of mangrove bark which are to be analyzed for tanning content. If the results are favorable, further study will be made of the possibility of commercial production and distribution.

Tung oil industry in the U. S. is buzzing along. American trees have produced between 6 and 7 million pounds a year; imports have been as high as 175 million. Synthetic rubber researchers are still looking for new sources. Weeds of all sorts, guayule wheat and corn are among the things being used. Canada plans synthetic rubber manufacture with petroleum from U. S. pipelines. Army and Navy are making considerable purchases of S. D. wood turpentine. Much turpentine is being made for lend-lease shipment. Parity prices on rosin were promoted three cents for April. Available supplies of turpentine are larger than had been expected. Labor is the vital problem in 1942 output of naval stores. Naval stores insiders are worried about bill becoming law to not permit CCC stocks to be sold below parity and its effect on the market for rosins.



Fertilizer Materials: Farmers enter the new planting season with the best prospects that they have had in 20 years. A special committee of three Senators, has been appointed by the President of the Senate, to make a full and complete study and investigation with respect to (1) the supply of commercial fertilizers in existence which are available for the use of American agriculture; (2) the supply of raw materials available for the manufacture of commercial fertilizers; (3) the current prices of such fertilizers and whether or not action should be taken to reduce such prices to freeze them, or to prevent them from increasing unduly and (4) such other matters relating to the production and distribution of such fertilizers as the committee may deem it appropriate to study and investigate with a view to the establishment of a national policy designed to make adequate supplies of such fertilizers available to American farmers at reasonable prices. The committee shall report to the Senate, as soon as practicable, the results of its study and investigation together with its recommendations, if any for legislation. Lend lease exports of fertilizer to Feb. 28 amounted to 567,295 tons. Fertilizer and insecticide shortages for this year are worrying cotton growers. They think that they may not get more than 20% as much cyanamid as they did last year and considerably less sodium nitrate. L. S. Hitchner of the Agricultural Insecticide and Fungicide Association claims that "barring unforseen circumstances there will be sufficient materials for normal insect infestation except in the case of rotenone." Maximum prices for fish meal are continued in effect. On March 26 maximum prices for meat scraps were reduced $5 per ton and digester tankage $6 per ton from the temporary ceiling prices prevailing since Jan. 20.

Paint Materials: A plan for developing an estimate of the total amount

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U.S.I. CHEMICAL NEWS

April ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

Lined Steel Drums Offer Solution of Packaging Problems

Save Tin and Zinc, Protect Products from Contamination

NEW YORK, N. Y. — Linings for steel drums and other containers are increasing in popularity as a means of conserving tin and zinc, while still protecting packaged products from contamination and containers from corrosion.

Among the linings which have been developed are types adaptable to a very wide range of packaging problems, according to a manufacturer here. One lining, for example, is described as insoluble in all known solvents, and hence especially suitable for packaging nitrocellulose lacquers, thinners, varnish removers, and similar products. When this lining is applied under proper conditions, the container is free from any paint or lacquer odor.

(*Continued on next page*)

Linings for containers such as these are suitable for packaging many types of products.

Plating of Non-Metallics Aids Metal Conservation

Processes for depositing metallic coatings on non-metallic surfaces, already familiar in such applications as electrotyping and mirror backing, are spreading into other fields as a means of conserving metals.

Plating of non-metallics provides a method of giving such materials a number of the advantages usually associated with metal parts: resistance to moisture absorption, friction, and wear. The advantages of combining metals and non-metals are often of such importance that manufacturers who adopt plating of non-metallics as an emergency measure may later retain the process as a part of their permanent production techniques.

In preparing non-metallic surfaces for plating, a bonding coat is usually applied as a preliminary to an electrically conducting coating. A solution of orange shellac in ethanol is frequently employed for this purpose, while a suspension of metal powder in nitrocellulose lacquer is effective as the conductive coating.

Ethyl Carbonate Enters New Fields of Chemical Utility

Originally Used Chiefly for Special-Purpose Lacquers, U.S.I. Product Finds New Applications as Raw Material

Ethyl carbonate (diethyl carbonate) is assuming new importance as a raw material for chemical manufacture, as a result of the interesting possibilities which it offers for the production of a number of unusual compounds. When U.S.I. first made ethyl carbonate available from a domestic source in commercial quantities, its most important applications were in special-purpose lacquers. Its utility as a starting point in chemical manufacture, however, is now surpassing its usefulness as a solvent.

Phenobarbital Manufacture

Among the most interesting reactions of ethyl carbonate are its Claisen condensations in the presence of metallic sodium, sodium ethoxide, or sodamide. With some cyanide derivatives, it forms the half nitrile of the corresponding malonic ester. For example, with benzyl cyanide, it gives ethyl alpha-cyano-phenylacetate, an intermediate in the manufacture of phenobarbital.

Other Claisen Condensations

Other Claisen condensations include:

1. With esters of aliphatic acids and of aryl substituted aliphatic acids, it gives an alpha-carbethoxyl derivative, which is a derivative of malonic ester:

(a) with ethyl acetate, it gives ethyl malonate, and also ethyl methanetricarboxylate, which is formed by the substitution of a second alpha hydrogen with the carbethoxyl group.

(b) with ethyl phenylacetate, it gives ethyl phenylmalonate.

2. With ketones, it gives beta-keto-esters:

(a) with acetone, it gives ethyl aceto-acetate.

Exceptions: In some cases, there is formed the alkyl carboxylic ester of the enol-form of the ketone instead of the beta-keto-ester. Ketones which condense rapidly with themselves

(*Continued on next page*)

Novel Oil Well Treatment Stops Brine Infiltration

MIDLAND, Mich. — Infiltration of water or brine can be prevented without substantially reducing the flow of oil, by means of a novel technique involving treatment of wells with alcohols or ketones.

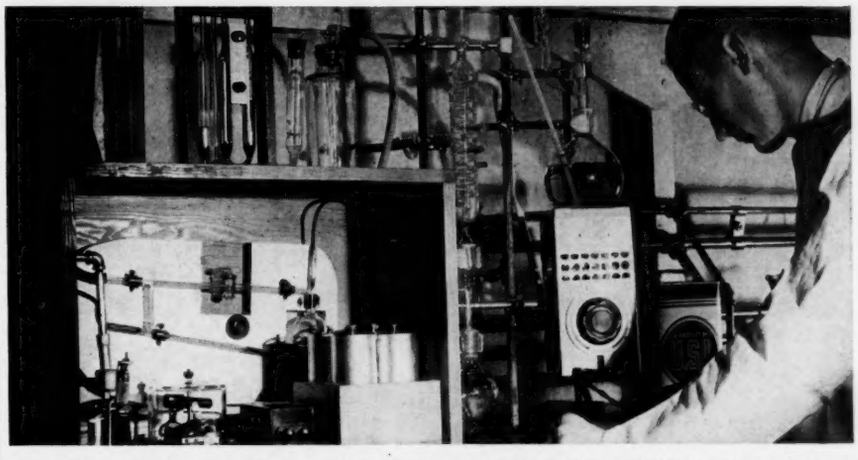
This claim is made in a patent granted to an inventor here. Present methods of stopping infiltration, the inventor points out, make use of materials which form water-insoluble deposits, and act to plug up water-bearing pores. However, these materials are applied in the form of solutions which tend to mix with the oil, and hence a considerable proportion is wasted.

If a liquid capable of absorbing water, and having a lower surface tension, is first injected, a much greater proportion of the plugging solution enters the water-bearing portions of the well formation, with resulting economies in the amounts needed.

Liquids capable of producing this result include ethanol, butanol, and acetone.

Paint Specifications Studied

A new subcommittee has been formed by the American Society for Testing Materials to give special study to traffic paints, with particular reference to quick methods of testing for durability. The subcommittee was formed jointly by Committee D-1 on paint, lacquer, and related products, and Committee D-4 on road materials.



Research constantly carried on in U.S.I.'s laboratories is directed toward the development of new chemicals and improvement in quality in existing products. The apparatus shown here is employed in the study of vacuum distillation processes.

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April ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Adds Organic Solvents To Minimize Breaking Of Lacquer Emulsions

WILMINGTON, Del.—While lacquer emulsions have been widely used for the production of protective or decorative film, one drawback to their use has been the tendency of the emulsions to break at temperatures below the freezing point of water. This difficulty can be overcome by the addition of a nitrocellulose solvent to the aqueous phase of the emulsion, according to a patent granted to an inventor here.

In producing these emulsions, a nitrocellulose solution is first prepared in the usual manner. This solution is then emulsified with an aqueous solution, which contains an emulsifying agent and a nitrocellulose solvent, the percentage of solvent ranging from 15 to 30% for best results.

Emulsions prepared in this way, with 15% acetone in the aqueous phase, are protected against freezing down to 23° F., the inventor claims. 30% acetone gives protection to about 9° F. In addition, these emulsions can be applied under conditions of high humidity, and result in increased gloss.

Container Linings

(*Continued from previous page*)

A second type, somewhat lower in cost, is insoluble in a number of solvents, and has also been used to good advantage in containers for edible fats. A third type has found application in containers for hydrogenated edible oil products, and is suitable for the packaging of lubricating oils, greases, and industrial oils.

A fourth type, still lower in cost, was developed chiefly to permit economies in the lining of containers for hydrogenated edible oil products when the container is intended for one-time shipment.

Where a high degree of resistance to corrosion is necessary, a prime-coat system, in which a clear top coat is applied over a pigmented prime, is reported to have shown excellent results. Field tests are said to indicate that this system produces linings about 400% more resistant than most one-coat finishes. It can be used with a number of products ordinarily packaged in glass or wood.

Recommended method of application of the linings is by spray brush, followed by baking.

Makes Aromatic Esters With Aid of Catalysts

ROCHESTER, N. Y.—Novel aromatic esters, which may find industrial utility in diversified fields, can be produced by a catalytic process involving reactions with alcohols.

This discovery forms the subject of a patent granted to an inventor here. An amino acid is reacted with an aliphatic alcohol in the presence of an acid esterification catalyst.

Uses of Ethyl Carbonate

(*Continued from previous page*)

in the presence of sodium ethoxide give very poor yields or no reaction at all with ethyl carbonate.

Miscellaneous Reactions

Other reactions of ethyl carbonate are:

1. Sodium or sodium ethoxide forms sodium ethyl carbonate.
2. Ammonia gives urethan and urea.
3. Primary and secondary amines give the corresponding substituted ureas.
4. Hydrazine gives ethyl carbazate (ethyl hydrazinecarboxylate) and carbohydrazide (sym. diaminourea).
5. Biguanide in boiling ethanol gives ammeline (2-hydroxy-4,6-diamino-1,3,5-triazine).
6. The Grignard reagent, RMgX, gives the ester of the next higher acid, $RCOOC_2H_5$.

Solvent Applications

Ethyl carbonate is a medium evaporating solvent, characterized by the desirable features of mold odor, high stability, and extremely low acidity. It is considered to be as nearly neutral a solvent as it is possible to make. Since the cost of ethyl carbonate is higher than that of the usual nitrocellulose solvents, its solvent applications are naturally limited to those cases where its desirable characteristics are more important than cost. A typical use is in coating radio tube cathodes.

In applications requiring a solvent of the type of ethyl carbonate, it is frequently found advantageous to use DIATOL, a special solvent manufactured only by U.S.I. DIATOL consists of not less than 90% ethyl carbonate and approximately 10% anhydrous ethanol. This solvent retains all the desirable features of ethyl carbonate, and, in addition, the ethanol content contributes substantially to quicker solvent application, improved blending, and better flow.

U.S.I. will gladly discuss potential applications of ethyl carbonate and DIATOL.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Processing of latex by a new method is said to extend volume by 50% to 300%, with only a slight decrease in the concentration. The process, which is described as applicable to latex for cementing, impregnating, and coating purposes, makes use of a filler material of fine size, which blends well with the rubber particles, and which resembles latex in many points, including susceptibility to vulcanization. **(No. 560)**

U S I

A dermatitis preventive is said to protect against skin affections caused by bacterial or fungus infestations in cutting, drawing, and core oils. It is described as an odorless germicide furnished in the form of tablets, which are dissolved in alcohol for addition to paraffin base oils. **(No. 561)**

U S I

Shatterproof properties are imparted to ordinary window or plate glass by the application of a new transparent, water-white liquid which forms an adherent coating and prevents the glass from shattering, according to the manufacturer. Coating does not affect vision or light. **(No. 562)**

U S I

A rustproofing solution is designed for application to metal surfaces as a preparation for corrosion-resisting paints or other coatings. It is said to produce a mild etch on the surface of the metal, resulting in the development of a chemically adherent inorganic base. **(No. 563)**

U S I

A weathering machine is said to permit duplication of the effects of summer sunlight, rain, heavy dew, and thermal shock, permitting accelerated testing of such products as paints, lacquers, plastics, fabrics, and rubber. **(No. 564)**

U S I

A synthetic wax, produced from domestic materials, is said to be suitable for replacing Japan wax in textile preparations, protective coatings, impregnants, and many other applications. Maker says that it is less subject to oxidation than Japan wax. **(No. 565)**

U S I

A new metal finish is said to provide a satisfactory substitute for chrome plating and other materials used for decorating and preserving metal. It can be applied also in the color finishing of black or brown plastics. **(No. 566)**

U S I

Two new drying oils have been developed from linseed and soybean oils, which are treated by a secret process. Commercial production is getting under way on the new oils, which are said to offer a satisfactory substitute for tung oil. **(No. 567)**

U S I

A new solder is intended to be applied to a surface or joint in metal, particularly aluminum, after the surface or joint has been heated. It is said to be suitable for use as a filler in aluminum castings, for repair application, and for corrosion-proofing of welded seams. **(No. 568)**

U S I

A clear liquid is added to water to prevent corrosion of metal surfaces by the deposition of a thin film, according to the maker. It is said to be suitable for use in water-supply plants, engine cooling systems, and other applications, and to be effective on iron, lead, brass, and copper. **(No. 569)**

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Butyl Phthalate
Ethyl Phthalate

OTHER ESTERS
*Diatol
Ethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
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of protective coatings required by the fighting services, the Maritime Commission, for lease-lend requirements and for Federal housing, and computing from this the amount that can be produced for civilian needs has been worked out by the War Production Board and a committee of paint, varnish and lacquer manufacturers in the New York area.

A. E. Horn, chairman of the committee, reported last month that he had conferred with various WPB officials and had been assured of cooperation. He presented the plan as a means of assuring that the industry could meet all war needs and could avoid diversion of coatings to civilian uses in greater quantities than would be consistent with war needs. He told the WPB men that the industry turned out 400,000,000 gallons last year and could produce much more if raw materials such as zinc, lead, titanium, chrome, etc., were made available through priorities.

Paint industry should suffer this year from cut in building activities.

PERSONALITIES

(*Continued from page 487*)

the Union League Club many years ago.

Since childhood Fergusson has been a devotee of tennis, but the toll of years and a recent eye ailment has forced him to forego this form of exercise. In earlier days he played tennis regularly in the Philadelphia championships and has several cups to attest to his prowess. He has enjoyed cricket, golf, even figure skating and football, throughout the years. He still has a gutta-percha golf-ball he used in playing the game as early as 1897. His hobby is working in metals and woods, and for this purpose he has a well-equipped work room in his home.

On February 6th, at the completion of the work day rounding out the 50th anniversary of Fergusson's connection with the business, his associates and a few old friends tendered him a testimonial dinner at the Ritz-Carlton Hotel in Philadelphia. Lyman S. Lloyd, vice-president of Alex C. Fergusson Co. was toastmaster. Responding, with his characteristic sense of humor and knack for relating jokes and occurrences, Fergusson asked his audience the privilege of men of his age to reminisce. He then called attention to the tremendous difference in the tempo of business today compared with his father's early days when a business trip to New York from Philadelphia started with a boat at Walnut Street Wharf to Bridesburg, the northern limits of the City, where one boarded a train at Perth Amboy, going from that point to the Battery by Ferry—a little matter of five and one-half hours. He pointed to the even greater progress that had been made by the chemical industry over the corresponding period, and after touching upon the astounding demands the present war imposes upon the industry, he expressed the conviction that the house of Fergusson would more than do its part in the crisis.

WASHINGTON

(*Continued from page 444*)

Office of Price Administration actions recently include:

Incorporation of enforcement provisions of the Emergency Price Control Act in 96 OPA maximum price schedules announced, so that such schedules now outstanding have the same effect as if issued under the Act.

Imposed maximum margins which mixers and dealers may charge to farmers for nitrate of soda, sulfate of ammonia and cyanamide.

Directed that wood pulp producers who signed individual agreements with OPA not to increase prices must absorb for time being, the added costs resulting from the recent freight rate increases. However, formal maximums are due to be established for the second quarter, which begins this month, and it was stated careful consideration would be given these freight factors in establishing the price ceiling.

Requested producers and sales agents of benzol, toluol, xylol and solvent naphtha obtained as coke-oven by-products to continue through second quarter, prices which prevailed through the first quarter of the year.

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Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - March 1942 $0.97

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks ..... lb.	...	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks ..... lb.	...	.12	.12	.11	.13
Acetamide, tech, kgs, wks .lb.	.28	.45	.28	.45	.28	.45
Acetanilid, tech, cryst, bbls ..... lb.	.29	.31	.29	.31	.29	.31
powd, bbls ..... lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd ..... lb.	.11¼	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs ..... lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) ..lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*) ....lb.	.08½	.173	.08½	.173	.07½	.173
Acetonitrile, drs, wks ...lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs .....lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs ..... lb.	...	1.00	1.00	1.00	1.00	1.00

ACIDS

Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls ..100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs .....100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks .....100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls ....lb.	...	.45	.45	.45	.45	.45
Standard USP .....lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks .....lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls ...lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls .....lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.65	1.85	1.65	1.85	1.85	2.10
Battery, cbys, wks ..100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls .....lb.	.43	.47	.43	.47	.43	.47
USP, bbls .....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran. frt all'd bgs 40 tons ....ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls .....ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls .....lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks .....lb.	...	.22	.22	.22	.22	.22
tks, wks .....lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks .....lb.	.25	.30	.25	.30	.25	.30
Chlorosulfonic, drs, wks ..lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks .....lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) .....lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls ...lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.23	.26½	.23	.26½	.23	.26½
Cleve's bbls .....lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.86	.81	.86	.76	.84
Low Boiling .....gal.	.81	.86	.81	.86	.76	.84
Formic, tech, cbys .....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls .....lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls .....lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls .....lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks .....lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks ...lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks .....lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls ...lb.	.029	.0315	.029	.035	.02½	.035
22%, light, bbls wks ...lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks ...lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs ....lb.	.20	.20½	.20	.20½	.15	.18¾
Laurent's bbls .....lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs .....lb.	...	.30	.30	.30	.30	.30
Anhydride, drs .....lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs .....lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit .....lb.	.05	.06	.05	.06	.05	.06
S unit .....lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks .....lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls .....lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls .....lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks .....100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks .....100 lb.	...	1.05	1.05	1.05	1.05	1.05
20°cbys, c-l, wks ..100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks .....100 lb.	...	1.15	1.15	1.15	1.15	1.15

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acid (continued):					
22° cbys, c-l, wks ..100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks .....100 lb.	...	1.65	1.65	1.65	1.65	1.65
CP cbys .....lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs .....lb.	.18	.18½	.18	.18½	.18	.18½
Naphthenic drs, 220-230 ..lb.	...	.10	.10	.10	.10	.10
tks, wks .....lb.	...	.09	.09	.09	.09	.09
Naphthionic, tech, bbls ...lb.	.60	.65	.60	.65	.60	.65
Nicotinic cns .....lb.	...	6.96	6.96	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks .....100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys .....lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*) ..lb.	.11¼	.14½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys .....lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal ..100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs .....lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks .....lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks .....lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls .....lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns .....lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*) .....lb.	...	.33	...	.33	...	.33
USP, bbls .....lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks ..lb.	...	.82	.82	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls .....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks .....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks .....lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks .....ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls ..lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls .....lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls .....lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles ...lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure, 100 lb pkg. lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks .....lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls .....lb.	.65	.75	.65	.75	.55	.75
dark, bbls .....lb.	...	.12½	.12½	.14	.13	.18
egg, edible .....lb.	1.73	1.78	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv .....lb.	...	.131	...	.131	.111	.131
c-l, drs, delv .....lb.	...	.141	...	.141	.121	.141
lcl, drs, delv .....lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. .....lb.	...	.42	.27	.42	.25	.27
secondary, tks, delv ....lb.						
drs, c-l, delv E of Rockies .....lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd .....lb.	...	.09	...	.09	...	.09
Benzyl, cans .....lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) ..lb.	.13½	.168	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd .....lb.	.14	.173	.13½	.173	.10	.168
Butyl, secondary, tks, delv .....lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv .....lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs .....lb.	...	.13	...	.13	...	.13
tks .....lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles .....lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC, FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks .....gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

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(Pellets—Crystals—Granular)

SODIUM POTASSIUM
AMMONIUM BARIUM
STRONTIUM

— • —

JOSEPH TURNER & CO.

RIDGEFIELD, NEW JERSEY

83 Exchange Place
Providence, R. I.

40th St. & Calumet Ave
Chicago, Ill.

Chemicals for Industry

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):					
Diacetone, pure, c-l drs, delv ... lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv ... lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv ... lb.	.11	.13½	.11	.13½	.09	.12
tks, delv ... lb.	.10	.14	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks ... gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs ... gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls ... gal. *g*	...	8.25	...	8.25	6.03½	8.25
Furfuryl, tech, 500 lb. drs lb.	.20	.25	.20	.25	.20	.25
Hexyl, secondary tks, delv lb.	...	.23	...	.23	.12	.23
c-l, drs, delv ... lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ... lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs lb.	...	.086	...	.086	.079	.086
c-l, drs ... lb.	...	.076	...	.076	.069	.076
tks ... lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks ... lb.	.23	.23	.23	.23	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd ... gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd ... gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd .. gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd ... gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl						
Polyvinyl A fib drs ... lb.	...	.54	.54	.54	.26	.54
B fib drs ... lb.	.65	.70	.65	.70	...	...
Propyl, nor, drs, wks gal.	.69	.75	.69	.75	...	...
Spec Solvents, East, drs, wks ... gal.	.67	.70	.67	.70	...	...
tks, East, wks ... gal.	.61	.66	.61	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks ... lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs ... lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv ... lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ... lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls ... lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ... lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks ... 100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila ..100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks ... 100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks 100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks ... 100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks ... 100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks 100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Chrome, bbls ....100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*) ... 100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls ... lb.	.10½	.11	.10½	.11	.10½	.11
Basic powd, bbls, delv lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks ... lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ... lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv ... lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks .... lb.	...	.034	...	.034	.029	.03½
Oleate, drs ... lb.	.17½	.20	.17½	.20	.17½	.20
Palmitate, bbls ... lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls ... lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls .. lb.	...	.23	...	.23	.18	.23
Sulfate, com, c-l, bgs, wks ... 100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks ....100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks ... 100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks ....100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv ... lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.	...	.08z	...	.08z	.04	.05¼
Ammonium Acetate, kgs .. lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks ... 100 lb	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls .. lb.	.15½	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls ... lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks ... 100 lb.	4.45	...	4.45	...	4.45	...
Gray, 250 lb bbls, wks ... 100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls .... lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ... lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ... lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs ... lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls ... lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs ... lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs lb.	.21	.23	.21	.23	.21	.22

z On a f.o.b. wks. basis.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):					
Phosphate, diabasic tech, powd, 325 lb bbls ... lb.	.07¼	...	.07¼	.09¼	.07¼	.09¼
Ricinoleate, bbls ... lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls ... lb.	...	.24½	...	.24½	...	.24½
Paste, bbls ... lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs .. lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane)						
tks, delv ... lb.	...	.145	...	.145	.105	.145
c-l, drs, delv ... lb.	...	.155	...	.155	.115	.155
lcl, drs, delv ... lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv lb.	...	.14½	...	.14½	...	.14½
Secondary, tks, delv ... lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ... lb.	...	.09½	...	.09½	...	.09½
tks, delv ... lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks lb.	.56	.68	.56	.68	.56	.68
mixed l c l drs, wks lb.	...	.08	...	.08	.0565	.08
tks, wks ... lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl						
lcl, dms ... lb.	...	.102	...	.102	...	...
cl, dms ... lb.	...	.095	...	.095	...	...
tks ... lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks ... lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs .... lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs .. lb.	...	.32½	...	.32½	.26	.335
Amylene, drs, wks ... lb.	.102	.11	.102	.11	.102	.11
tks, wks ... lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks ... lb.	...	.14½	...	.14½	...	.14½
Annatto fine ... lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% ... lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls ... lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots ... lb.	.14½	...	.14	.14½	.14	.16½
Butter of, see Chloride						
Chloride, soln, cbys .... lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ..... lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls ... lb.	.15	.16½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs lb.	...	.34	...	.34	.28	.34
Archil, conc, 600 lb bbls lb.	...	.26	...	.26	no prices	
Arociors, wks ... lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ... lb.	.10¼	.10¾	.10¼	.10¾	.09½	.10¾
Arsenic, Metal ... lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs .... lb.	no prices		no prices		no prices	
White, 112 lb kgs .... lb.	.04	.04¼	.04	.04¾	.03½	.04¾
B						
Barium Carbonate precip, 200 lb bgs, wks ... ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs ... ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1 ... ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls ... lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls ... lb.	.10½	.12½	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks ... ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk, mines .... ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ... ton	...	16.00	...	16.00	...	16.00
200 mesh ... ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ... lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.15	...	.15	.14	.15
90% c-l, drs ... gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls ... lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs ... lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks ... lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ... lb.	1.25	...	1.25	...	1.25	1.35
Tech, 200 lb bbls .... lb.	...	.51	...	.51	.51	.52
Bismuth metal ... lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes ... lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes ... lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes ... lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, boxes .... lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs ..... lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs ... lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks ... ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks ... lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	5.50	5.25	5.50	4.75	5.25
Chicago, high grade .. unit	...	5.80	5.40	5.80	5.00	5.40
Imported shipt ... unit	...	5.35	5.00	5.35	4.75	5.00
Blues, Bronze Chinese						
Prussian Soluble .... lb.	...	.36	...	.36	.33	.36
Milori, bbls ... lb.	...	.36	...	.36	.33	.36
Ultramarine,* dry, wks, bbls ... lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	.16	.27	.16	.27	.16	.20
Pulp, Cobalt grade ... lb.	.22	.24	.22	.24	.22	.24

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

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AMERICAN-BRITISH CHEMICAL SUPPLIES, Inc
180 MADISON AVE., NEW YORK, N.Y.

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Bone, 4½ + 50% raw, Chicago	ton	39.00	40.00	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp	ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago	ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv	ton *i*	...	46.00	45.00	46.00	43.00	45.00
bbls, delv	ton *i*	...	55.00	54.00	55.00	53.00	56.00
Tech, powd, 80 and 40 ton lots, bgs	ton	...	51.00	50.00	51.00	48.00	50.00
bbls, delv	ton	...	60.00	59.00	60.00	58.00	61.00
Bordeaux Mixture, drs	lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases	lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*)	lb.	...	.59	...	.59	...	.57
Gold, blk	lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks	lb.	...	.02½	...	.02½	.02½	.03
Butyl, acetate, norm drs, frt all'd	lb.	.14½	.168	.14½	.168	.10	.168
tks, frt all'd	lb.	.13½	.158	.13½	.158	.09	.158
Secondary, tks, frt all'd	lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd	lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks	lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)							
Chloride, normal lcl, drs	lb.	...	.35	.28	.35	...	...
c-l, drs	lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv	lb.	...	.35	...	.35	...	.35
Lactate	lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd	lb.	...	.25	...	.25	...	.25
Propionate, drs	lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv	lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs	lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs	lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks	lb.	...	.35½	...	.35½	...	.35½

C

Cadmium Metal	lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes	lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv	100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs	lb.	.07	.08	.06½	.08	.06	.07½
Carbide, drs	lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l	ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv	ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv	ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv	ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks	lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls	lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks	lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs	ton	no prices		no prices		no prices	
Palmitate, bbls	lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls	lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls	lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls	lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs	lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder	lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs	lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants	lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l	lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl	lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv	lb.	...	.73	...	.73	.66½	.73
Casein, Standard, Dom, grd	lb.	.21	.22	.21	.30½	.11½	.31
80-100 mesh, c-l bgs	lb.	.21½	.22½	.21½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks	ton	...	17.00	16.00	17.00	15.00	16.00
Imported, ship, bgs	ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs	lb.	.13	.15	.13	.15	.12	.15
Transparent, cs	lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs	lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd	lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls	lb.	...	.02⅞	...	.02⅞	.02¼	.02⅞
Precip, heavy, 560 lb cks	100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks	bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv*	ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks	lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks	lb.	...	.0225	...	.0225	.01¾	.0275
25%, bbls, wks	lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines	ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk	ton	18.60	23.00	18.60	23.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*)	lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract	lb. *j*	...	.05¼	...	.05¼	...	.05¼

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority. (*PC*) Price Ceiling.

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Chlorine (continued): Liq, tk, wks, contract	100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont	lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks	lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks	lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs	lb.	...	.20	...	.20	...	.20
USP, 650 lb drs	lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls	lb.	...	.80	...	.80	...	.80
Chrome, Green, CP	lb.	.23	.33	.23	.33	.21	.25
Yellow	lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls	lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls	lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls	bbl.	7.50	7.75	7.50	7.75	7.50	7.75
Cobalt Acetate, bbls (A)	lb.	...	.83¾	...	.83¾	.80½	.83¼
Carbonate tech, bbls (A)	lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A)	lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls	lb.	...	.42	...	.42	.33	.42
paste, 5%, drs	lb.	...	.31	...	.31	...	.31
Oxide, black, bgs (A)	lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls	lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls	lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs	lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs	lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC* 100 lb.		12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv	lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls	lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls	lb.	...	.20½	.19½	.20½	.16	.19½
Cyanide, 100 lb drs	lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls	lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks	lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls	lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls	lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.		5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks	ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls	100 lb.	...	3.54	3.54	4.05	3.36	4.05
Corn Syrup, 42°, bbls	100 lb.	...	3.69	3.52	3.69	3.42	3.52
43°, bbls	100 lb.	...	3.74	3.57	3.74	3.47	3.57
Cotton, Soluble, wet 100 lb bbls	lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls	lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys	lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks	gal.	...	.15½	...	.15½	.13½	.15½
Grade 2	gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l	lb.	.11	.11¼	.11	.11½	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks	lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale	lb	nom	.05¼	...	.05¼	.04¾	.05¼
Cyanamid, pulv, bgs, c-l, frt all'd, nitrogen basis, unit		no prices		no prices		...	1.40

D

Derris root 5% rotenone, bbls	lb.	.45	nom	.40	.45	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago	100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs	100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs	lb.	...	.09½	...	.09½	.08	.08½
White, 220 lb bgs, lcl	lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl	lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs	100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks	lb.	...	.61	.50	.61	.47	.50
lcl drs, wks	lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks	lb.	...	.105	...	.105	.095	.105
lcl, drs	lb.	...	.112	...	.112	...	...
tks, wks	lb.	...	.09½	...	.09½	.08½	.09½
Diamylether	lb.	...	...	...	...	.085	.102
lcl, drs	lb.	...	.102	...	.102	...	...
c-l, drs	lb.	...	.095	...	.095	...	...
tks	lb.	...	.085	...	.085	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks	lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs	lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks	lb.	...	.22	.21	.22	.21	.21½
Diamyl Sulfide, drs, lcl	lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.							
Dibutoxy Ethyl Phthalate, drs, wks	lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks	lb.	...	.64	.53	.64	...	.53
c-l, drs, wks	lb.	...	.61	.50	.61	...	.50
tks, wks	lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl	lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd	lb.	.21	.23	.21	.23	.19	.20
Dibutyltartrate, 50 gal drs	lb.	...	.87	...	.87	.50	.87
Dichlorethylene, drs	lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks	lb.	.15	.16	.15	.16	.15	.16
tks, wks	lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks	lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs	lb.	...	.037	...	.037	.025	.04
lcl, drs	lb.	...	.045	...	.045	...	...
tks, wks	lb.	...	.03	...	.03	.0221	.025
Diethanolamine, tks, wks	lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks	lb.	...	.81	.70	.81	...	.70

* These prices were on a delivered basis.

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Plant and Main Office:
Niagara Falls, New York
New York Office: 22 E. 40th St., New York City

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss ....lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs ..lb.	...	.21½	...	.21½	.19	.20
Diethylsulfate, tech, drs, wks, lcl ....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks ....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ...lb.	...	.16	...	.16	...	.16
Oleate, bbls ....lb.	...	.17	...	.17	...	.17
Stearate, bbls ....lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd ....lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls ....lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls ....lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls ....lb.	...	.15	...	.15	.15	.20
Diphenylamine ....lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs ....lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	65.00	55.00	65.00	32.00	52.00
Extract ....lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
Egg Yolk, dom., 200 lb. cases lb.	.87	.92	.87	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY .....100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls .....100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs ....lb.	.52	.53	.52	.53	.26	.53
Isopropyl 50 gal drs ...lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd ....lb.	...	.06	...	.06	...	.06
Nitrous conc bottles ...lb.	...	.73	...	.73	...	.73
Synthetic, wks, tks .....lb.	...	.08	...	.08	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd ....lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd ....lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ...lb.	.11¼	.12¼	.11¼	.12¼	.06¾	.12¼
drs, frt all'd ....lb.	.12¼	.13¼	.12¼	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs .....lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd ....lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ....lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ..lb.	...	.30	...	.30	...	.30
Crotonate, drs ....lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd ..lb.	...	.27¾	...	.27¾	.25	.27¼
Lactate, drs, wks ....lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks ....lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks ....lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs ....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous ....lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies ....lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks..lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks ....lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks ....lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks ....lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks ....lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks ....lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl ....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ....ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks ....ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls ....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling.

Current

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks ..... unit *l*	nominal	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ..... unit *m*	nominal	2.75	3.25	2.75	3.25
Fluorspar, 98% bgs ..... ton	... 33.00	32.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP, PC*) ..... lb.	.055 .0575	.055	.0575	...	...
Fossil Flour ..... lb.	.02½ .04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50 15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ..... ton	30.00 40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	... .15	...	.15	.10	.15
tks, wks ..... lb.	... .09	...	.09	...	.09
Furfuramide (tech) 100 lb drs ..... lb.	... .30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18 .18½	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes ..... lb.	.28 .32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½ .16	.12½	.16	.10½	.16
Solid, 50 lb boxes ..... lb.	.19 .21	.19	.21	.19	.21
G					
G Salt paste, 360 lb bbls .. lb.	... .45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices	...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs ..... 100 lb.	.13 nom.	.12½	.13	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks ..... 100 lb.	1.05 1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate					
Glue, bone, com grades, c-l bgs ..... lb.	.15½ .18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19 .30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs ... lb.	... .18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs ... lb.	... .18¼	...	.18¼	...	.18¼
Saponification, drs ..... lb.	... .12¾	...	.12¾	.09½	.20½
Soap Lye, drs ..... lb.	... .11½	...	.11½	.07⅞	.18
Glyceryl Bori-Borate, bbls lb.	... .40	...	.40	...	.40
Monoricinoleate, bbls ... lb.	... .27	...	.27	...	.27
Monostearate, bbls ..... lb.	... .30	...	.30	...	.30
Oleate, bbls ..... lb.	... .22	...	.22	...	.22
Phthalate ..... lb.	... .38	...	.38	...	.38
Glyceryl Stearate, bbls ... lb.	... .18	...	.18	...	.18
Glycol Bori-Borate, bbls .. lb.	... .22	...	.22	...	.22
Phthalate, drs ..... lb.	... .38	...	.38	...	.38
Stearate, drs ..... lb.	... .26	...	.26	...	.26
GUMS					
Gum Aloes, Barbadoes ... lb.	.80 .85	.80	.85	.80	.95
Arabic, amber sorts .... lb.	.22 .24	.22	.24	.14	.25
White sorts, No. 1, bgs lb.	.33 .35	.33	.35	.35	.45
Powd, bbls ..... lb.	.26 .28	.26	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY ..... lb.	.04½ .05½	.04½	.05½	.04½	.05½
California, f.o.b. NY, drs ton	35.00 40.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY ..... lb.	.12 .15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases ..... lb.	.45 .50	.45	.50	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque ..... lb.	... .49½	...	.49½	...	.49½
Dark amber ..... lb.	... .12¾	...	.12¾	...	.12¾
Light amber ..... lb.	... .17	...	.17	...	.17
Copal, East India, 180 lb bgs					
Macassar pale bold ... lb.	... .17⅜	...	.17⅜	.12¾	.17⅜
Chips ..... lb.	... .11½	...	.11½	.06¾	.11½
Dust ..... lb.	... .07	...	.07	.05¼	.07
Nubs ..... lb.	... .13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold ..... lb.	... .22⅜	...	.22⅜	.15¾	.22⅜
Chips ..... lb.	... .12⅜	...	.12⅜	.08½	.12⅜
Dust ..... lb.	... .07	...	.07	.05¼	.07
Nubs ..... lb.	... .17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb	... .14	...	.14	.13⅞	.14
Loba B ..... lb.	... .14¼	...	.14¼	.11¾	.14¼
Loba C ..... lb.	... .13⅞	...	.13⅞	.11¼	.13⅞
DBB ..... lb.	... .12¼	...	.12¼	.10	.12¼
MA sorts ..... lb.	... .10¼	...	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold genuine .. lb.	... .22⅞	...	.22⅞	.15⅜	.22⅞
Chips ..... lb.	... .14½	...	.14½	.10	.14½
Mixed ..... lb.	... .17⅞	...	.17⅞	.14⅜	.17⅞
Nubs ..... lb.	... .18⅞	...	.18⅞	.12¾	.18⅞
Split ..... lb.	... .19⅝	...	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases					
A ..... lb.	... .35¼	...	.35¼	.21⅝	.35¼
B ..... lb.	... .34⅜	...	.34⅜	.20¼	.34⅜
C ..... lb.	... .28⅝	...	.28⅝	.14⅜	.28⅝
D ..... lb.	... .25⅝	...	.25⅝	.13¼	.25⅝
A/D ..... lb.	... .28⅜	...	.28⅜	.15¼	.28⅜
A/E ..... lb.	... .25⅝	...	.25⅝	.12⅞	.25⅝
E ..... lb.	... .18¾	...	.18¾	.10	.18¾
F ..... lb.	... .13¾	...	.13¾	.08	.13¾
Singapore, No. 1 ..... lb.	... .30⅝	...	.30⅝	.16⅜	.30⅝
No. 2 ..... lb.	... .25⅜	...	.25⅜	.12¼	.25⅜
No. 3 ..... lb.	... .12⅜	...	.12⅜	.07⅛	.12⅜
Chips ..... lb.	... .23½	...	.23½	.11	.23½
Dust ..... lb.	... .13	...	.13	.07⅛	.13
Seeds ..... lb.	... .17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l ..... lb.	... .08⅞	...	.08⅞	.08½	.08⅞
Ester ..... lb.	.08½ .09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases .... lb.	2.30 2.35	.95	2.35	.95	1.00
Powd, bbls ..... lb.	2.50 2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs ..... lb.	.11 .15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ... lb.	.14 .33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling.

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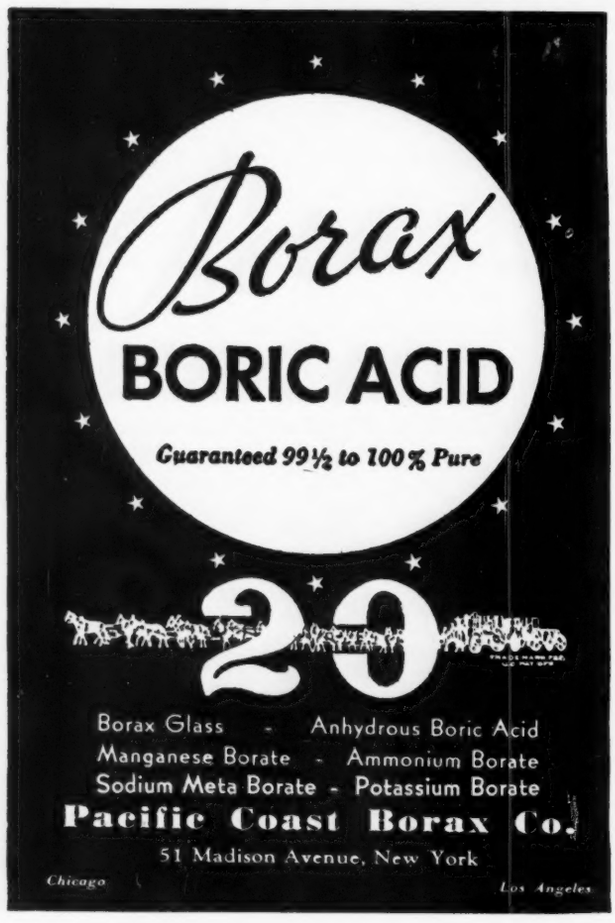

Kauri, NY
Logwood

Prices

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y						
Brown XXX, cases ....lb.	...	.60	...	.60	...	.60
BX ....lb.	...	.38	...	.38	...	.38
B1 ....lb.	...	.28	...	.28	...	.28
B2 ....lb.	...	.24	...	.24	...	.24
B3 ....lb.	...	.18½	...	.18½	...	.18½
Pale XXX ....lb.	...	.61	...	.61	...	.61
No. 1 ....lb.	...	.41	...	.41	...	.41
No. 2 ....lb.	...	.24	...	.24	...	.24
No. 3 ....lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins ....lb.	no prices		no prices		no prices	
Mastic ....lb.	3.25	3.30	3.25	3.30	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks ..lb.	1.00	1.10	1.00	1.10	.50	1.10
Senegal, picked bgs ....lb.	...	.30	...	.30	...	.30
Sorts ....lb.	...	.13	...	.13	...	.13
Thus, bbls ....280 lbs.	...	16.50	...	16.50	15.00	16.50
Tragacanth, No. 1, cases ..lb.	3.50	3.60	3.50	3.60	2.75	3.40
No. 2 ....lb.	2.00	3.00	2.00	3.00	2.45	2.80
No. 3 ....lb.	1.10	1.20	1.10	1.20	1.10	2.60
Yacca, bgs ....lb.	.06½	.07¾	.06½	.07¾	.03½	.07¾
H						
Hematine crys, 400 lb bbls lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls wks ....lb.	nom.	.03½	nom.	.03½	.03½	.03½
tks ....lb.	nom.	.03	nom.	.03	.02¾	.03
Hexalene, 50 gal drs, wks lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks (*PC*) ..gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (*FP*) ....lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs ....lb.	.13	.13½	.13	.13½	.13	.13½
tks ....lb.	...	.12	...	.12	...	12
Hoof Meal, f.o.b. Chicago unit	4.00	4.25	3.00	4.25	2.65	3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys ....lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, Bags, No. 1 ...lb.	...	.42	...	.42	.40	.42
I						
Indigo, Bengal, bbls ....lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid ....lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars ..lb.	...	2.00	...	2.00	...	2.00
Irish Moss, ord, bales ...lb.	.30	.35	.30	.35	.25	.31
Bleached, prime, bales ..lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq. 17°, bbls delv ....lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride						
Nitrate, coml, bbls ..100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C) drs, frt all'd ....lb.	...	.23½	...	.23½	.22½	.23½
tks, frt all'd ....lb.	...	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd ....lb.	...	.10	.076	.10	.06½	.07½
drs, frt all'd, c-l ....lb.	...	.12	.086	.12	.07½	.08½
Ether, see Ether, isopropyl						
K						
Keiselguhr, dom bags, c-l, Pacific Coast ....ton	22.00	25.00	22.00	25.00	22.00	25.00
L						
Lead Acetate, f.o.b. NY, bbls, White, broken ....lb.	.12¾	.13¼	.12	.13¼	.11	.12½
cryst, bbls ....lb.	.12¾	.13¼	.12	.13¼	.11	.12½
gran, bbls ....lb.	.13½	.14	.12¾	.13¼	.11¾	.13¼
powd, bbls ....lb.	.13½	.14	.12¾	.13¼	.11¾	.13¼
Arsenate, East, drs ....lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls ....lb.	...	.19	...	.19	...	.19
Metal, c-l, NY (*FP*) 100 lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls ....lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv ....lb.	...	.09	...	.09	.08	.08¾
97% Pb_3O_4, delv ....lb.	...	.09¼	...	.09¼	.084	.086
98% Pb_3O_4, delv ....lb.	...	.09½	...	.09½	.0865	.0885
Resinate, fused, bbls ...lb.	...	.09½	...	.09½	.09½	.16½
Stearate, bbls ....lb.	...	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd ....lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks, lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks ....lb.	...	.07½	.06314	.07½	.06½	.07
Lime, chemical quicklime, f.o.b. wks, bulk ....ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks ..ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks gal.	.07½	.08½	.07½	.08½	...	.07½
drs ....gal.	.10	.14	.10	.14	.10	.14
Linseed Meal, bgs ....ton	...	34.00	...	34.00	23.00	33.00
Litharge, coml, delv, bbls lb.	...	.0790	...	.0790	.07	.0760
Lithopone, dom, ordinary, (*PC*), delv, bgs ....lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls ....lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs ....lb.	...	.056	...	.056	.05¼	.056
bbls ....lb.	...	.0585	...	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls lb.	...	.13	...	.13	.10½	.13
Solid, 50 lb boxes ....lb.	...	.22	...	.22	.16½	.22

(*FP*) Full Priority. (*PC*) Price Ceiling.

		Current Market	1942 Low	1942 High	1941 Low	1941 High
M						
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls	ton	74.00	80.00	74.00	80.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks	ton	...	32.00	...	32.00	...	32.00
Metal Ingots, c-l	lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd	lb.	...	.26	...	.26	...	.26
Light bbls above basis	lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis	lb.	...	.26	...	.26	...	.26
Palmitate, bbls	lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls	lb.	.20	.25	.20	.25	.11	.25
Stearate, bbls	lb.	.31	.33	.31	.33	.23	.31
Manganese, acetate, drs	lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Chloride, bbls	lb.	.14	nom.	.14	nom.	...	.14
Dioxide, tech (peroxide), paper bgs, c-l	ton	...	70.00	...	70.00	...	71.50
Hydrate, bbls	lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs	lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls	lb.	...	.19	...	.19	...	.19
Resinate, fused bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.10½	.11½	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls	lb.						
Bark, African	ton		no prices		no prices	34.00	38.00
Mannitol, pure cryst, cs, wks	lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls	lb.	...	.40	...	.40	.35	.45
Marble Flour, blk	ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel)	lb.	...	2.95		2.95	2.70	2.95
Mercury metal ..76 lb. flasks		191.00	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks	lb.	...	.10½	...	.10¼	.10¼	.15
drs, c-l	lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl	lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls	lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls	lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls	lb.	...	.70	...	.70	.65	.70
Methanol denat. grd. drs, c-l frt all'd (*PC*)	gal.	...	.66	...	.66	.60	.66
tks, frt all'd	gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd	gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat	gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs	gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth	gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv	lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv	lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv	lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv	lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs	gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd	gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs	gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd	gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone	lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks	lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd	lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks	lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl	lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd	lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l	lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd	lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs	lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd	lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks	ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs	lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks	lb.	...	.16	...	.16	.16	.19
crude	lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks	lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks	lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks	lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs c-l, wks	lb.	...	.48	.40	.48	...	.40
l-c-l, wks	lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"							
Monoethanolamine, tks, wks,	lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks	lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l	lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks	lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

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BROMSTYROL
CINNAMIC ACID
DIACETYL
METHYL CINNAMATE
METHYL PHENYL ACETATE
PHENYL ACETIC ACID
BENZALDEHYDE
BENZYL ALCOHOL
BENZYL CHLORIDE
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Prices

Myrobalans
Para Toluidine

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices	no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices	no prices		no prices	
J1 bgs ton	no prices	no prices		35.00	48.00
J2 bgs ton	no prices	no prices		28.00	39.00
N					
Naphtha, v.m.&p. (deodorized) see petroleum solvents.					
Naphtha, Solvent, water-white, tks gal.	...	.27	...	.27	...	.26
drs, c-l gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks lb.	2.50	2.75	2.50	2.75	2.25	2.75
Balls, flakes, pks lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.09
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks unit	...	3.50	2.75	3.50	2.20	3.00
dom, Western wks unit	...	3.35	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.03½ nom.		.03½	.03¾	.03⅛	.03¾
tks lb.	.02 nom.		...	.02	.02¾	.03
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*) 122-127° M P lb.	...	.052	...	.052	.04¼	.057
128-132° M P lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls lb.	...	.70	...	.70	...	.70
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) ..gal.	...	...	.08½	...	.08½
drs, group 3 .....gal.	.11½	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) .....lb.	.08	.08	.08½	.08	.08½
Petrolatum, dark amber, bbls .....lb.	...	...	.03¾	.02¾	.03½
White, lily, bbls .....lb.	...	...	.05¾	.04¾	.05¾
White, snow, bbls .....lb.	...	...	.06½	.05½	.06½
Petroleum Ether, 30-60°, group 3, tks .....gal.	...	...	.16	.13½	.16
drs, group 3 .....gal.	...	...	.18	.14½	.18

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks .....gal.	...	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	...	.10½	...	.10½	.10	.10½
Lacquer diluents, tks East Coast .....gal.	...	...	.11	...	.11	.09½	.11
Group 3, tks .....gal.	.07⅜	.07⅜	.08⅛	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks .....gal.	...	...	.10½	...	.10½	.09	.11
Group 3, tks, wks ...gal.	...	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks .....gal.	.08¾	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ...gal.	.06	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks ..gal.	...	...	.10½	...	.10½	.09½	.10½
Group 3, tks, wks ...gal.	...	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East, tks, wks .....gal.	...	...	.09½	...	.09½	.083	.09½
Group 3, wks .....gal.	...	...	.06⅝	...	.06⅝	.05½	.06⅝
Phenol, 250-100 lb drs ....lb.	.12½	.12½	.13	.12½	.13	.12	.13¾
tks, wks (*FP*) .....lb.	.11½	.11½	.12	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs .....lb.	...	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com .....lb.	...	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins ..lb.	15.00	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons .....lb.	20.00	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis .....ton	...	2.40	2.70	2.40	2.70	2.15	2.40
72% basis .....ton	...	3.00	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.00	2.20	2.00	2.20	1.90	2.00
75-74% basis .....ton	...	...	4.00	...	4.00	...	2.90
Tennessee, 72% basis ..ton	...	...	5.00	...	5.00	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) .....lb.	.15	.15	.18	.15	.18	.15	.18
Red, 110 lb cases .....lb.	.40	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .lb.	.38	.38	.42	.38	.42	.38	.42
Trichloride, cyl .....lb.	.15	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks .....lb.	.14½	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist .....lb.	...	...	.74	...	.74	.50	.65
Steam dist wat wh bbls gal.	...	...	1.10	...	1.10	.59	.68
Pitch Hardwood, wks ...ton	23.75	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ....ton	19.00	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06	.06½	.06	.06½	.06	.06½
Imported .....lb.	no prices			no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.							
Pine, bbls .....bbl.	6.75	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, 1-c-l, drs, f.o.b. wks .....lb.	...	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol ..lb	.06¼	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake .....lb.	...	...	.07	...	.07	...	.07
liquid, tks .....lb.	...	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom 30% basis, blk .....unit	...	...	.60	...	.60	...	.60

POTASSIUM

Potassium Abietate, bbls ..lb.	...	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb bbls .....lb.	...	...	.14	...	.14	.14	.17
Bichromate Crystals, 725 lb csks *(*FP*) .....lb.	...	...	.09⅝	...	.09⅝	.08⅞	.09⅝
Binoxalate, 30 lb bbls ..lb.	...	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks .....lb.	...	...	.0275	...	.0275	...	.0275
drs, wks .....lb.	.03	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs, wks (*FP*) .....lb.	nom.	nom.	.11	nom.	.11	...	.11
gran, kgs .....lb.	.12	.12	.14½	.12	.14½	.12	.14½
powd, kgs .....lb.	.09¾	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls ....lb.	.08	nom.	.08	nom.	.04	.08	
Chromate, kgs (*FP*) ...lb.	.24	.24	.27	.24	.27	.24	.27
Cyanide, drs .....lb.	...	...	.55	...	.55		.55
Iodide, 250 lb bbls .....lb.	1.44	1.44	1.88	1.44	1.88	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.56	.58	.56	.58	.53½	.58
Oxalate, bbls .....lb.	.28	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (*FP*) .....lb.	.09½	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority. (*PC*) Price Control.

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FRANKS CHEMICAL PRODUCTS CO.
BLDG. 9, BUSH TERMINAL — BROOKLYN, N.Y.

Potassium Permanganate
Schaeffer's Salt

Prices

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):					
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) lb.	.20½ .21	.19¾	.21	.19¼	.21
Prussiate, red, bbls lb.	no prices	no prices		no prices	
Yellow, bbls lb.	.17 .19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	... 36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls lb.	... .45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ton	... 26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*) lb.	... .03	...	.03	.03¾	.04
Putty, com'l, tubs 100 lb.	... 3.15	...	3.15	...	3.15
Linseed Oil, kgs 100 lb.	... 5.00	...	5.00	...	5.00
Pyrethrum, conc liq:					
2.4% pyrethrins, drs, frt all'd gal.	... 5.75	4.30	5.75	4.40	4.95
3.6% pyrethrins, drs, frt all'd gal.	... 8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs lb.					
bgs lb.	.27 .28	.21	.28	.20	.25
Fine powd, bbls lb.	.28 .29	.22	.29	.21	.26
Pyridine, denat, 50 gal drs gal.	... 1.71	...	1.71	...	1.71
Refined, drs lb.	... .46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk unit	no prices	no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15 2.40	2.15	2.40	2.15	2.40
Q					
Quebracho, 35% liq tks lb.	... .05¼	...	.05¼	.03¾	.05¼
450 lb bbls, c-l lb.	... .05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif lb.	... .04⅞	...	.04⅞	.	.04⅞
Clarified, 64% bales lb.	... .05	...	.05	.05	.05⅛
Quercitron, 41 deg liq, 450 lb. bbls lb.	... .10	...	.10	.08½	.09½
Solid, drs lb.	... .18	...	.18	.11	.16½
R					
R Salt, 250 lb bbls, wks lb.	... .55	...	.55	...	.55
Resorcinol, tech cans lb.	.68 .74	.68	.74	.68	.74
Rochelle Salt, cryst lb.	... .43½	...	.43½	.32½	.43½
Powd, bbls lb.	... .42½		.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	... .51	.48	.51	.40	.50
Second run gal.	... .53	.50	.53	.42	.56
Third run, drs gal.	... .57	.54	.57	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**					
B	... 3.57	3.57	3.66	2.06	3.55
D	... 3.55	3.45	3.65	2.08	3.55
E	... 3.61	3.61	3.74	2.07	3.62
F	... 3.61	3.61	3.79	2.08	3.59
G	... 3.61	3.61	3.79	2.18	3.52
H	... 3.62	3.62	3.79	2.27	3.50
I	... 3.62	3.62	3.79	2.26	3.50
K	... 3.73	3.73	3.88	2.36	3.61
M	... 3.80	3.79	3.94	2.38	3.68
N	... 3.90	3.90	4.05	2.47	3.71
WG	... 4.65	4.65	4.81	2.79	4.52
WW	... 5.30	4.85	5.20	3.05	4.57
X	... 5.30	4.85	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**					
B	... 2.90	2.90	3.10	1.31	3.00
D	... 2.92	2.92	3.21	1.51	3.00
E	... 2.96	2.96	3.27	1.60	3.07
F	... 2.96	2.96	3.24	1.62	3.04
G	... 2.97	2.97	3.24	1.60	2.97
H	... 2.97	2.97	3.24	1.63	2.97
I	... 2.97	2.97	3.24	...	2.98
K	... 3.08	3.08	3.30	1.84	3.06
M	... 3.15	3.15	3.39	2.01	3.13
N	... 3.25	3.25	3.50	2.65	3.16
WG	... 4.00	4.00	4.26	2.76	3.97
WW	... 4.65	4.30	4.65	2.96	4.02
X	... 4.65	4.30	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70	2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls lb.	no prices	no prices		no prices		no prices
Powdered, bbls lb.	no prices	no prices		no prices		no prices
S						
Sago Flour, 150 lb bgs lb.	.05 .05¾	.04¾	.05¾	.03½	.05½
Sal Soda, bbls wks 100 lb.	... 1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ton	... 15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ton	... 16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls lb.	... .082	...	.082	.076	.082
Cryst, bbls lb.	... .092	...	.092	.086	.092
Powd, bbls lb.	... .092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls lb.	.01¼ .01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs lb.	... .46	...	.46	...	.46

** Jan. 30. 1941, high and low based on 280 lb. unit.
r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y., refined 6c higher in each case; (*FP*) Full Priority. (*PC*) Price Ceiling.

Current

Shellac
Tungstate

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. *s*	.39	.40	.39	.40	.26	.40
Garnet, bgs .....lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs .....lb. *s*	.32	.33	.32	.34	.16½	.34
T. N., bgs .....lb. *s*	.31	.32	.31	.33	.16	.33
Silver Nitrate, vials .....oz.	...	.20⅞	...	.20⅞	.24	.20⅞
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs ....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls .....100 lb.	...	1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	...	2.00
SODIUM						
Sodium Abietate, drs .....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	...	.05	...	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv .....lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs .....lb.	.69	.73	.69	.73	.39	.73
Antimoniate, bbls .....lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs .....lb.	...	.08	...	.08	.07	.08¾
Arsenite, liq, drs .....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	...	.06¾	...	.06¾	.06½	.09¼
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.70	...	1.70	...	1.70
Bichromate, 500 lb cks, wks* (*FP*) .....lb.	...	.07⅜	...	.07⅜	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks .....lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks .....lb.	...	.08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	...	2.75	...	2.75	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	...	2.45	...	2.45	...	2.45
Iodide, Jars .....lb.	...	2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	...	.40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks .....100 lb.	...	2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs .....100 lb.	...	4.00	...	4.00	3.75	4.00
wks, lcl, drs ...100 lb.	...	5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	...	.026	...	.026	.023	.026
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY .....ton	...	29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	...	30.05	...	30.05	29.40	30.05
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	...	.06¾	...	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. .....lb.	...	.04¾	...	.04¾	.04½	.04¾
Perborate, drs, 400 lb ..lb.	...	.14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks .....100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	2.90	3.05	2.90	3.05	2.45	3.05
bgs, wks .....100 lb.	2.70	2.85	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs ..lb.	...	.65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks .....lb.	...	.11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0545	.0638	.0545	.0638	.0510	.0610
Sesquisilicate, drs, c-l, wks .....100 lb.	...	3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks .....100 lb.	...	1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks .....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	.12	.15	.12	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls .....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. *t*	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks .....lb.	...	.024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks .....lb.	...	.0315	...	.0315	.03	.03¾
Sulfite, powd, 400 lb bbls wks .....lb.	...	.05¼	...	.05¼	...	.05¼
Sulfocyanide, drs .....lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls ...lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *t* Bags 15c lower; * Feb. 28. (*PC*) Price Control.

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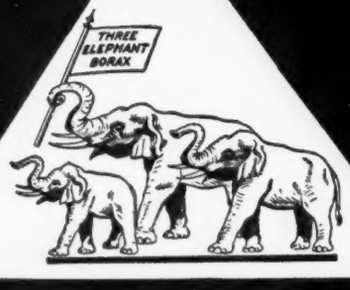

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70 PINE STREET NEW YORK

Sorbitol
Tributyl Citrate

Prices

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Sorbitol, drs, wks	lb.	...	.17¾	...	.17¾	.14¾	.17¾
Spruce, Extract, ord, tks	lb.	...	.01½	.01¼	.01½	.01⅜	.01¼
Ordinary, bbls	lb.	...	.02⅛	.01¾	.02⅛	.01⅜	.01¾
Super spruce ext, tks	lb.	...	.01½	...	.01½	.01⅜	.01½
Super spruce ext, bbls	lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs	lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs	100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs	100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs	lb.	...	.0610	...	.0610	.04½	.0585
Imp, bgs	lb.	no prices		no prices		no prices	
Rice, 200 lb bbls	lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant	100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs	lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks	lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY	lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks	lb.	...	.45	...	.45	...	.45
tech, bbls, wks	lb.	...	.40	...	.40	...	.40

SULFUR

Sulfur, crude, f.o.b. mines	ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs	100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls	100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs	100 lb.	...	2.05	...	2.05	...	2.05
bbls	100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs	100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs	100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls	100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs	100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls	100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs	100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls	100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks	lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl	lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks	lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks	lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks	lb.	.16	.40	.16	.40	.16	.40
Multiple units, wks	lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd	ton	no prices		no prices		no prices	
Extract, 42°, bbls	lb.	.08	.06¼	.08	.06¼	.06	.08
Superphosphate, 16% bulk, wks	ton	...	10.10	...	10.10	8.50	10.00
Run of pile	ton	...	9.60	...	9.60	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit	ton	...	.80	...	.80	.68	.80

T

Talc, Crude, 100 lb bgs, NY	ton	14.00	16.00	14.00	16.00	14.00	16.00
Ref'd 100 lb bgs, NY	ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Tankage, Grd, NY	unit ‱	...	4.85	4.25	4.85	2.35	4.10
Ungrd	unit ‱	...	5.70	5.25	5.70	2.35	5.10
Fert grade, f.o.b. Chgo	unit ‱	...	5.90	5.60	5.90	2.35	5.60
South American cif	unit ‱	...	5.60	5.05	5.60	2.60	4.75
Tapioca Flour, high grade, bgs	lb.	.04	.07	.04½	.07	.03	.06¾
Tar Acid Oil, 15%, drs	gal.	...	.27½	...	.27½	.22	.24
25% drs	gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs	gal.	...	.32½	...	.32½	.26	.29
tks, delv, E. cities	gal.	...	.24	...	.24	...	.22
Tartar Emetic, tech, bbls	lb.	...	.47¾	...	.47¾	.36¾	.47¾
USP, bbls	lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs	lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs	lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech	lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks	lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls	lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks	lb	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*)	lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks	lb.	.55	.57	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks	lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls	lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls	lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls	lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls	lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls	lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls	lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks	lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*)	gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*)	gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls	lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls	lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs	lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks, lb.		...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks, lb.		...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs	lb.	...	1.01	...	1.01	...	1.01
Tributylamine, lcl, drs, f.o.b. wks	lb.	...	.81	...	.81	...	.81
Tributyl citrate, drs, frt all'd	lb.	...	.24	...	.24	.24	.26

(*FP*) Full Priority.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	...	.08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*) ..... lb.	...	.25	...	.25	.22	.36½
Triethanolamine, 50 gal drs, wks ..... lb.	...	.19	...	.19	...	.19
tks, wks ..... lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks ..... lb.	...	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ..... lb.	...	.30	...	.30	...	.30
Stearate bbls ..... lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. ..... lb.	...	.54	...	.54	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi .... lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine ..... lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*) ..... lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated, bgs, wks ton	21.00	26.00	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls ..... gal.	...	.80¾	.80	.82½	.45	.83
Savannah, bbls ..... gal.	...	.66¾	.66¾	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY ..... gal.	.73	.76	.73	.80	.35	.76
tks, delv E. cities .. gal.	...	.68	.68	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities ..... gal.	.65	.70	.65	.70	.35	.65
tks, delv E. cities .. gal.	...	.58	...	.58	...	...

U

Urea, pure 112 lb cases .. lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points ..... ton	no prices		no prices		no prices	
Dom f.o.b., wks ..... ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis ..... ton	...	121.58	...	121.58	...	121.58

V

Valonia beard, 42%, tannin bgs ..... ton	no prices		no prices		no prices	
Cups, 32% tannin bgs .. ton	no prices		no prices		no prices	
Extract, powd, 63% ... lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .... lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol ..... lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin ..... lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs .. lb.	3.12	3.17	3.12	3.17	3.12	3.17

W

Wattle Bark, bgs ..... ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls .. lb.	.046	.0475	.046	.0475	.03⅞	.05
Wax, Bayberry, bgs ..... lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases ..... lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs .. lb.	...	.49	...	.49	.30	.47
Brazilian, bgs ..... lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.59	.60	.55	.60	.35	.52
Candelilla, bgs ..... lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs ..... lb.	.87	.88	.87	.88	.68	.88
No. 2, yellow, bgs ... lb.	.85	.86	.86	.87	.66	.85
No. 2, N. C., bgs .... lb.	.82	.83	.82	.84	.62	.79
No. 3, Chalky, bgs ... lb.	.75	.76	.75	.77	.55	.78
No. 3, N. C., bgs .... lb.	.77	.78	.77	.79	.58	.79
Ceresin, dom, bgs ..... lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases .... lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs .... lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.26	.27	.24	.27	.24	.25
Cakes, cases ..... lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs .... ton bgs, c-l, wks ..... ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks .. ton	20.00	24.00	16.00	24.00	16.00	20.00

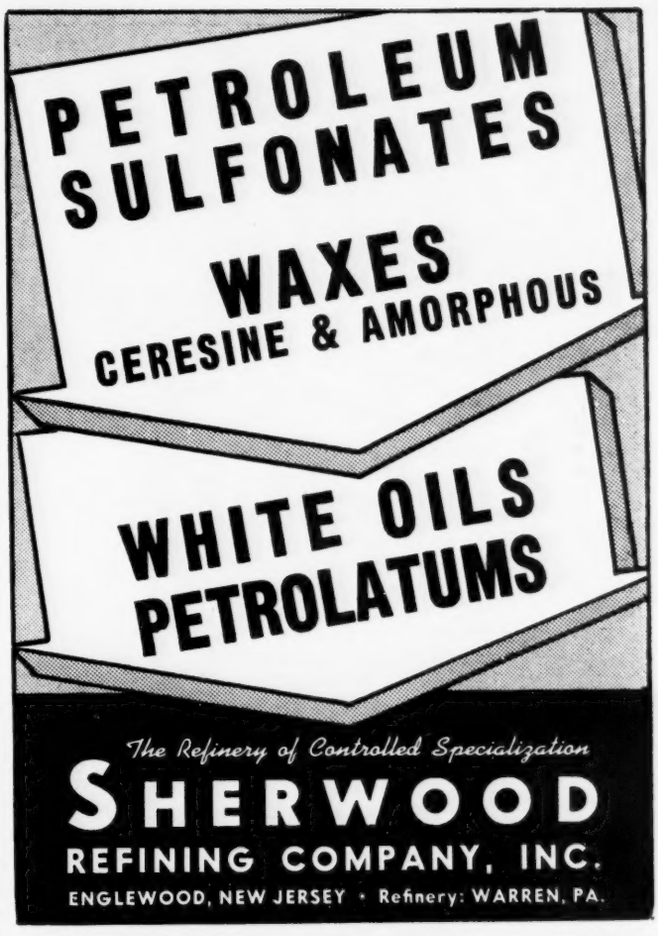
X

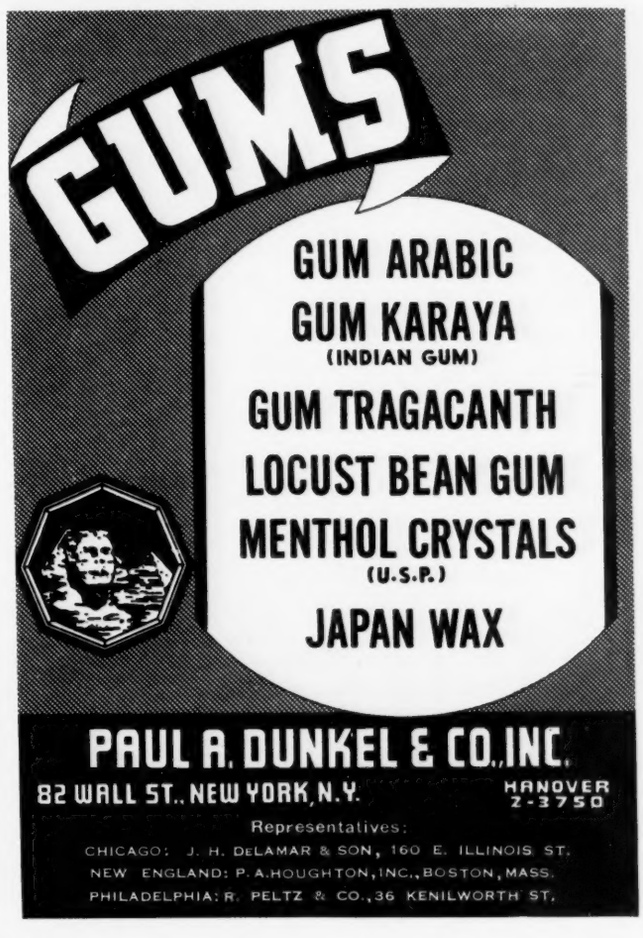
Xylol, frt all'd, East 10° tks, wks ..... gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36

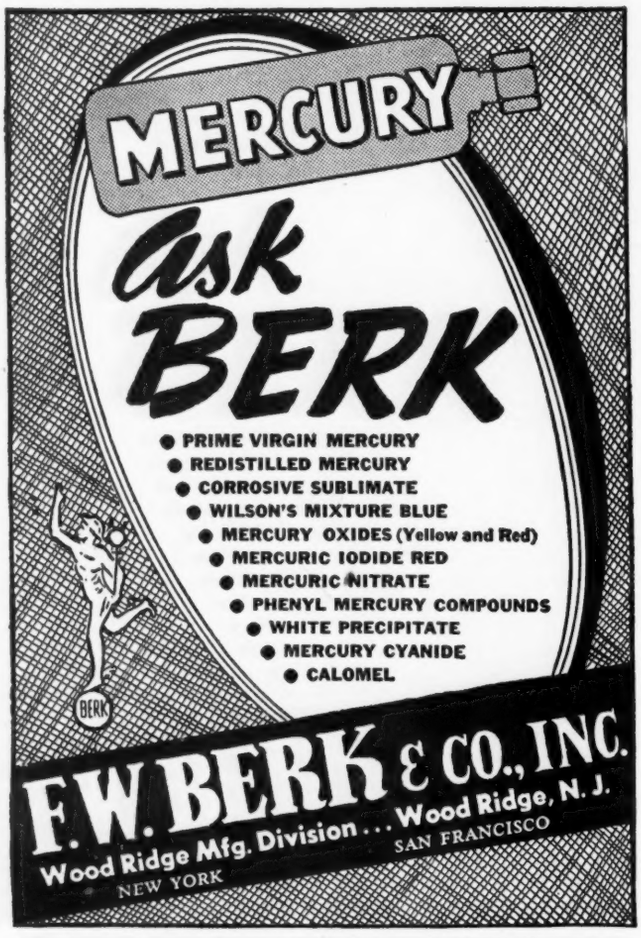
Z

Zein, bgs, 1000 lb lots, wks ..... lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ..... lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd .. lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks ..... lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

(*FP*) Full Priority. (*PC*) Price Control.







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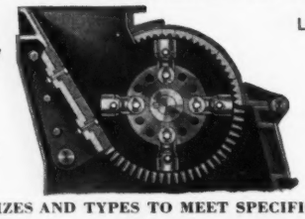

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Prices Current

Zinc Cyanide
Whale Oil

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)							
Cyanide, 100 lb drs	lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv	lb.	...	.1035	...	.1035	.09¼	.103
Metal, high grade slabs, c-l, NY (*FP*) (*PC*) 1000 lb.	lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis 100 lb.	lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks	lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks	lb.	...	.07¼	...	.07¼	.06¾	.07½
Palmitate, bbls	lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls	lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls	lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks	lb.	...	.360	.360	.365	.315	.365
Flake, bbls	lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv	lb.	...	.08½	.08	.08½	...	.08
bgs, delv	lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs	lb.	.24	.29	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	no prices		no prices			.06
Castor, No. 3, 400 lb drs	lb.	...	.13¾	.12½	.13¾	.0180	.12½
(*PC*) Blown, 400 lb drs	lb.	...	.15¼	.14	.15¼	.11¾	.14
China Wood, drs, spot NY	lb.	.40⅜ nom.		.40⅜ nom.		.27¼	.37¼
Tks, spot NY	lb.	.38¾ nom.		.38¾ nom.		.26¼	.35½
Coconut, edible, drs NY	lb.	no prices		no prices		.08	.15½
Manila, tks, NY	lb.	no prices		no prices		.03⅜	.10
Tks, Pacific Coast	lb.	no prices		no prices		....	.03¼
Cod, Newfoundland, 50 gal bbls	gal.	...	.85	...	.85	.07½	.80
Copra, bgs, NY	lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills	lb.	.12¾ nom.		.12½	.12¾	.06⅝	.13
Refd, 375 lb bbls, NY	lb.	.15½ nom.		...	.15½	.14¾	.16
Degras, American, 50 gal bbls, NY	lb.	.11½	.12⅛	.11½	.12⅛	.07½	.08¾
Greases, Yellow	lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY	lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime	lb.	...	.15½	...	.15½	.08½	.14½
Extra, bbls	lb.	...	.15¼	.15	.15¼	.08¼	.13¾
Extra, No. 1, bbls	lb.	...	.14⅝	.14½	.14⅝	.08	.13¼
Linseed, Raw less than 5 drs lots	lb.	...	.147	.125	.147	.091	.123
drs, c-l, spot	lb.	.139	.141	.117	.141	.095	.190
Tks	lb.	...	.113	.108	.113	.084	.1060
Menhaden, tks, Baltimore	gal.	...	.666	.63¾	.666	.30	.60
Refined, alkali, drs	lb.	.124	.1280	.12	.1280	.084	.122
Kettle boiled, drs	lb.	.134	.1380	.13	.1380	.096	.132
Light pressed, drs	lb.	.1140	.1180	.11	.1180	.082	.112
Tks	lb.	.106	.108	.102	.108	.072	.10
Neatsfoot, CT, 20°, bbls, NY	lb.	...	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY	lb.	...	.14½	...	.14½	.08¼	.14
Pure, bbls, NY	lb.	...	.17¾	...	.17¾	.12¼	.17¾
Oiticica, bbls	lb.	.25¼ nom.		.25¼ nom.		16½	.23½
Oleo, No. 1, bbls, NY	lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY	lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY	gal.	4.40	4.50	4.00	4.50	2.25	4.25
Edible, bbls, NY	gal.	5.00	5.30	5.00	5.30	4.75	5.30
Foots, bbls, NY	lb.	.19½	.20	.19	.20	.10¼	.19
Palm, Kernel, bulk	lb.	no prices		no prices		no prices	
Niger, cks	lb.	.09¼ nom.		.09¼ nom.		.04¼	.09
Sumatra, tks	lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill	lb.	.13	nom.	.13	nom.	.05¼	.16
Refined, bbls, NY	lb.	.17	nom.	.16¾	.17	.08	.16
Perilla, drs, NY	lb.	...	.246	...	.246	.18	.23
Tks, Coast	lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.							
Rapeseed, blown, bbls, NY	lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY	gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs	lb.	.133	.143	.12¾	.143	.07¼	.13
Tks	lb.	...	.1245	.12	.12½	.06¼	.11½
Sardine, Pac Coast, tks	gal.	.66½ nom.		.66½ nom.		.39	.62½
Refined alkali, drs	lb.	.124	.128	.12	.128	...	...
Light pressed, drs	lb.	.114	.118	.11	.118	.084	.122
Tks	lb.	.106	.108	.102	.108	.078	.112
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	.12¼ nom.		.12¼ nom.		.05⅜	.12¾
Crude, drs, NY	lb.	.13	nom.	.13	nom.	.06¼	.12¼
Ref'd, drs, NY	lb.	.14¼ nom.		.14¼ nom.		.05½	.12¼
Tks	lb.	.13½ nom.		.13½ nom.		.07⅝	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY	lb.	.1301	...	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY	lb.	.1278	...	.1278	nom.	.103	.12
Stearic Acid, double pressed dist bgs	lb.	.15	.16½	.15	.16½	.09½	.13¾
Double pressed saponified bgs	lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs	lb.	.18	.19½	.18	.19½	.12½	.16½
Stearine, Oleo, bbls	lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks	ton	...	55.00	40.00	55.00	...	...
tks, wks	ton	...	40.00	30.00	40.00	...	...
dist, drs, c-l, delv	lb.	...	.05	.04	.05	...	...
tks, wks	lb.	...	.04½	.03½	.04½	...	...
Tallow City, extra loose	lb.	...	.097¼	...	.097¼	...	.07⅜
Edible, tierces	lb.	no prices		no prices		...	.05⅝
Acidless, tks, NY	lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs	lb.	...	.08¾	...	.08¾	.06½	.08¼
Double bbls	lb.	...	.12	...	.12	.09½	.11
Whale:							
Winter bleach, bbls, NY	lb.	...	.1110	...	.1110	.099	.1110
Refined, nat, bbls NY	lb.	...	.1070	...	.1070	.095	.1070

(*FP*) Full Priority. (*PC*) Price Control.

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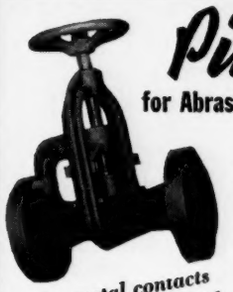

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A377. Hydrocarbons, Bulletin 96. This is the first edition of "Philips Hydrocarbons" and presents in condensed form information on the properties, uses (other than fuel) and specifications of the many hydrocarbons now commercially available. Phillips Petroleum Co.

Equipment—Catalogs

E643. Centrifugal Pumps; Bulletin No. 7167. Features of Class GT Two-Stage centrifugal pumps are illustrated in 12-page illustrated bulletin. Contains performance tables and tabulation showing friction of water in various sizes of pipe. Details of the pumps and applications are cited. Cameron Pump Division, Ingersoll-Rand Co.

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E647. Tablet Compressing Machines; Catalog 41-T. 48-Page illustrated book discusses application, economics and other advantages of manufacture, by tabletting or compressing, of fine chemicals, pharmaceuticals, powdered metals, etc. It points out how tabletting methods are used to reduce bulk, to increase the efficiency of chemicals, as in the case of catalyzer pellets, and to speed-up production by the use of automatic equipment. Tabletted products such as catalyzers, explosives, deodorizers, boiler compounds, color and dye tablets, salt cakes and many others are featured. Various types of automatic machines are described, to produce small tablets at rates up to several thousand per minute, to apply pressures up to 300 tons for compressing chemical cakes up to 10" diameter, and for a wide range of other applications. F. J. Stokes Machine Co.

E648. Texrope Sheaves; B6082-A. Stationary and motion-control sheaves are described, and operating diagrams, sizes, and dimensions are given. Allis-Chalmers Manufacturing Co.

E649. Truck Cranes; Book No. 1928. Model HC-70 truck-mounted crane is described. Brief specifications, clearance dimensions and lifting capacities are given, including capacities with 30, 40 or 50 ft. long boom, with or without the use of outriggers. Link-Belt Speeder Corp.

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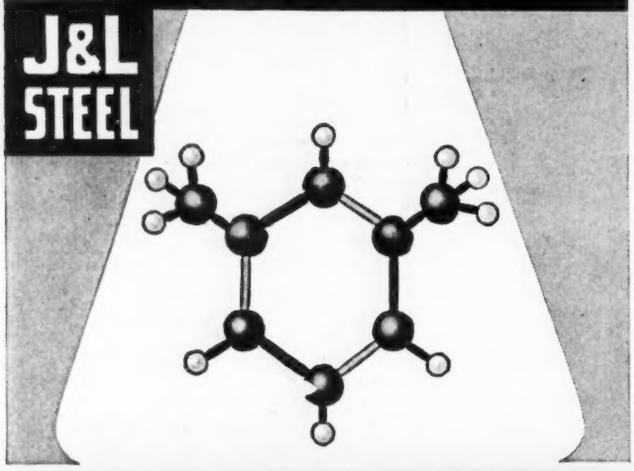

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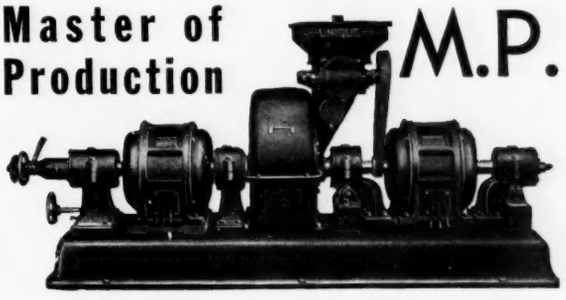

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"WE"-EDITORIALLY SPEAKING

The severing of long business connections and associations if they have been mutually beneficial and have brought to those participating real happiness and profit, are not pleasant to contemplate. For this and many other reasons of a personal nature, it is with the deepest feeling of regret that "We" report "Bill" George is resigning from "C.I." to accept a position with Hooker Electrochemical. It was with this company that he first became associated with the chemical field several years ago. Our loss is their gain. In the fourteen years that Bill has been associated with this publication, he has contributed materially to its success. He has helped to formulate many of its soundest policies. Every move on his part has been a constructive one, constructive for the industry as well as the publication he was so proud of and which he served so well. This was the test that he subjected every publishing idea to—will it further the interests of the industry as a whole? If it did not, he rejected it, even though its acceptance might mean a momentary monetary gain. The very best of everything for him in this new field of endeavor, is the wish of every member of this staff.

Many of our readers have been inquiring as to just what has happened to the popular feature "Personalities in Chemistry." Well we are delighted to report that A. D. McFadyen's interesting reviews are back with us again this month. Mr. McFadyen's selection for last month was William Preston Fitzgerald, Vice-President and Manager of Research and Development, J. T. Baker Chemical. The March issue was just about to go to press when we received the distressing news of the sudden death of Mr. Fitzgerald.

Dr. William C. Geer, author of that masterpiece "Elastomers in the Nation's War Program"—which appeared in the January issue of "C. I.," and which has set a record for the number of requests for reprints, stopped by and had lunch with us a few days ago. Dr. Geer, who lives in Ithaca gets into New York all too infrequently. The delightful doctor is a perfect example of perfect "retirement." All he is doing is researching about fourteen hours a day and sandwiching in a very considerable amount of important consultation work. We were specially interested in hearing about his cooperation with the Cornell botanists and horticulturalists who are working to ferret out new sources of natural rubber.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

Arthur Krock, noted newspaper columnist, writing from Detroit to the New York Times:—"If Washington can transform from peace to war as the Detroit area has, it won't be too long now." For the benefit of a great many individuals with Washington addresses what Mr. Krock was referring to was Victory.

Army and navy officials still feel that too many Americans are still not "War-Conscious." The WPB is doing a pretty good job along these lines what with cutting down razor blade production and insisting that buyers of tooth paste and shaving cream packed in tubes must bring in an empty one before a sale can be made. We wonder how many of the old fashioned ideas of saving wastes we will retain after we succeed in teaching the Nazis and Japs that a shave every day is definitely NOT a sign of physical, moral and mental decadence.

We are delighted to cooperate with the War Production Board on the following:—The WPB is extremely anxious to obtain the names of all the solvents reclaimers in the country. They are specially desirous of finding companies with reclamation capacity in excess of their present requirements. Officials of companies should communicate immediately with E. F. Mulligan, Industrial Salvage Section, Bureau of Industrial Conservation, Room 2605, Social Security Building, Washington, D. C.

Did you know that known underground reserves of crude oil in the United States at the beginning of this year have been estimated at a new record of 19,589,296,000 barrels? Based on the production of 1,404,182,000 barrels in 1941, these reserves are sufficient to last fourteen years.

Here is a score sheet listing the fifteen wishes of Hitler. The percentage-curious can find their own place by checking the items they have found themselves believing at any time, and by knocking off for each 6.6 % from the perfect score of 100.

1. Democracy is dying.
2. Our armed forces are weak.
3. The "new order" is inevitable.
4. We are lost in the Pacific.
5. Our West Coast is in such grave danger there is no point in fighting on.
6. The British are decadent, and "sold us a bill of goods."
7. The cost of the war will bankrupt the nation.
8. Civilian sacrifices will be more than we can bear.
9. Stalin is getting too strong, and Bolshevism will sweep over Europe.
10. Our leaders are incompetent, our government incapable of waging war.
11. Aid to our allies must stop.
12. Our real peril is the Japanese, and we must join Germany to stamp out the yellow peril.
13. We must bring all our troops and weapons back to the United States, and defend only our own shores.
14. The Chinese and the British will make a separate peace with Japan and Germany.
15. American democracy will be lost during the war.

Fifteen Years Ago

From Our Files of March, 1927

Advance in tung oil prices focuses attention on the new development of a domestic industry.

Department of Justice files injunction suit, under Sherman Anti-trust Law and anti-competition provisions of the Wilson Tariff Act, against a group of German and French potash producers.

German fertilizer trust makes first sample shipment of "nitrophoska" to the United States.

California Chemical Corp. plans large plant capacity increase in magnesium chloride.

National Lead buys Titan Co.

Dr. Leo H. Baekeland honored at the annual dinner party of the Chemists' Club (N. Y.).

E. T. Bedford, President, Corn Products Refining, denies rumor that Corn Products is seeking control of Commercial Solvents.

I. G. Dyestuff Corp. files incorporation papers in Louisiana and will build a plant at Monroe, La.

August Merz tells Philadelphia paint men that American manufacturers must be aware of German competitors.

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City_____

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Dept. D

State of Chemical Trade

Current Statistics (March 31, 1942)—p. 102

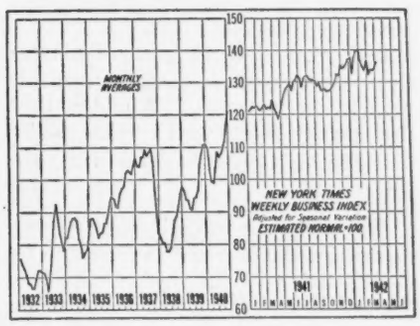
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output* 1941	Electrical Output* 1940	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Price Indices Fert. Mat.	Mixed Fert.	All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Mar. 7	770,697	742,617	+ 3.8	3,392,121	3,004,639	+12.9	101.4	120.3	136.0	118.9	115.3	124.1	97.1	97.2	132.3	103.4
Mar. 14	779,356	759,607	+ 5.2	3,357,444	2,983,591	+12.5	101.1	120.3	136.1	118.9	115.3	124.0	97.1	97.4	133.7	103.6
Mar. 21	796,640	769,984	+ 3.5	3,357,032	2,983,049	+12.5	100.7	120.3	136.2	118.9	115.3	124.0	97.1	97.9	133.8	103.4
Mar. 28	804,746	793,803	+ 1.4	3,345,502	2,975,407	+12.4	102.2	120.3	136.2	118.9	115.3	124.9	97.1	99.0	133.8	103.8

MONTHLY STATISTICS

CHEMICAL:	Jan. 1942	Jan. 1941	Dec. 1941	Dec. 1940	Nov. 1941	Nov. 1940
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	No Longer Available					
Consumpt. in mfr. fert.						
Stocks end of month						
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.			44,408,521	23,762,244	37,541,115	23,346,835
Comp. denat. prod., wine gal.			2,756,962	948,014	2,603,431	2,269,815
Removed, wine gal.			2,683,441	1,011,972	2,725,465	2,329,505
Stocks end of mo., wine gal.			203,692	453,090	137,197	516,516
Spec. denat. prod., wine gal.			15,945,814	11,266,809	14,361,093	10,884,671
Removed, wine gal.			15,604,829	11,427,406	14,251,186	11,210,915
Stocks end of mo., wine gal.			924,096	906,414	586,355	1,069,005
Ammonia sulfate prod., tons *a*	65,548	64,669	65,620	64,381.5	61,359	62,934
Benzol prod., gal. *b*	13,470,000	13,130,193	13,567,027	12,528,000	12,037,199	11,886,000
Byproduct coke, prod., tons *a*	5,229,297	4,932,989	5,186,420	4,890,030	4,833,483	4,763,500
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	1,113,319	719,336	989,700	715,240	1,018,435	661,258
Sheets, ship., lbs.	1,191,391	704,497	1,143,634	701,292	1,095,382	730,384
Rods, prod., lbs.	362,840	349,402	343,973	302,198	337,228	306,670
Rods, ship., lbs.	408,070	329,138	376,567	273,640	345,694	305,657
Tubes, prod., lbs.	141,438	97,794	150,920	91,219	127,349	92,766
Tubes, ship., lbs.	155,397	78,760	138,013	93,060	127,572	94,958
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	585,319	616,525	500,697	867,234	557,758	934,006
Shipments, lbs.	541,536	674,574	549,893	733,014	609,165	1,036,674
Molding comp., ship.; lbs.	3,597,003	1,583,885	3,165,174	1,317,352	2,777,317	1,410,496
Methanol (Bureau of the Census)						
Production, crude, gals.	No Longer Available					
Production, synthetic, gals.						
Pyrozylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.					4,072,081	3,318,461
Heavy goods, ship., linear yds.					2,900,534	2,457,154
Pyroxylin spreads, lbs. *c*					6,522,824	5,775,919
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	Exports and Imports No Longer Available					
Crude sulfur *d*						
Coal-tar chemicals *d*						
Industrial chemicals *d*						
Imports						
Chemicals and related prod. *d*						
Coal-tar chemicals *d*						
Industrial chemicals *d*						
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	148.9	126.3	148.6	125.7	147.7	125.3
Other than petroleum	153.7	128.1	153.2	127.1	152.3	126.4
Chemicals	186.6	152.0	185.9	149.9	184.9	148.0
Explosives	Not Available		Not Available		Not Available	
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	203.3	142.1	200.9	143.9	194.2	139.4
Other than petroleum	213.0	145.2	209.2	145.4	202.3	141.2
Chemicals	280.0	188.2	271.6	187.9	264.6	181.7
Explosives	Not Available		Not Available		Not Available	
Price index chemicals*	95.3	85.6	88.6	77.7	88.3	85.1
Drugs & Pharmaceuticals*	126.3	96.5	123.0	96.2	123.2	95.9
Fert. mat.*	78.6	70.7	77.8	70.0	77.3	69.9
Paint and paint mat.	99.1	86.7	96.5	85.4	95.3	85.7
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertiliser and fert. materials	Exports and Imports No Longer Available					
Total phosphate rock						
Total potash fertilisers						
Imports (long tons, Nat. Fert. Association)						
Fertiliser and fert. materials						
Sodium nitrate						
Total potash fertiliser						

Industrial Trends



Business: War production speeded up, conversion continued in rapid progress and consumer goods were maintained at high levels during the past month. In February the Federal Reserve Board's index of industrial production rose from 171 to 173. The "New York Times" index of business activity went down slightly from 136.7 for week ending February 28 to 136.0 for week ending April 4.

Steel: Production has recently been hitting new highs as a result of improvement in the scrap situation. Better weather conditions have stepped up collections. New records are seen in the coming months as the new facilities come into use and increase the capacity. Iron ore shipping season opened twelve days earlier this year and indications are shipments down the lakes will be about 5,000,000 tons above the record total of 1941.

Electric Output: Electric power output has remained contraseasonally high. With the Pacific Coast and New England states leading, output during the four weeks of March were about 12.6% higher than similar period last year.

Carloadings: Freight carloading during the four weeks of March totaled 3,171,439 cars an increase of approximately 3.5% over similar period of 1941. According to estimates compiled by the thirteen Shippers' Advisory boards, freight carloadings in the second quarter of 1942 are expected to be about 14.6% above actual loading in second quarter of 1941.

Construction: Total construction contracts awarded last month in 37 eastern states amounted to $610,799,000, according to F. W. Dodge Corp. This

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is the highest March total recorded since 1927 and is almost $131,000,000 or 27% ahead of corresponding month last year.

Each of the three major categories of construction, non-residential, residential and heavy engineering (public works and utilities) show substantial increases over last year on the basis of comparing March 1942 and March 1941 and on comparing first quarter records of the two years.

Indication of the progress of conversion of construction to war purposes is seen in the fact that 72% of the 1942 first-quarter dollar total was for public projects as compared with 47% for 1941.

Automotive: In changing over to war production the industry has lived up to its reputation of performing engineering and production miracles. A large volume of armaments is now flowing from automotive plants and is expected to reach staggering proportions considerably ahead of schedule.

Textiles: Textile production has been running about 15% ahead of last year. The industry is under considerable pressure to expand production but is experiencing many difficulties in doing so, reasons being that equipment and raw materials are difficult to get and manpower is beginning to desert to better paying war industries.

Retail Trade: Sales have continued to run considerably above last year on a value basis and moderately above on unit volume basis. Because of taxes and shortages it is expected that sales on a volume basis will not be able to hold up. Department of Commerce experts have estimated that physical volume of goods and services to be purchased this year will fall about 10% below last year.

Commodity Prices: Wholesale prices continued to move upward, particularly for food, clothing and household items. More controls were put into effect, but it looks like drastic overall ceilings may have to come.

Outlook: Industrial activity may be expected to expand markedly during the spring and summer months as converted and new plants come into production. Prices will probably have to come under greater control either by sales taxes or by general overall freezing. Unemployment is receding and is expected to recede rapidly over the next few months. The problem of labor supply may become acute in certain industries and localities and lead to a labor mobilization program, possibly including conscription.

MONTHLY STATISTICS (cont'd)

	Jan. 1942	Jan. 1941	Dec. 1941	Dec. 1940	Nov. 1941	Nov. 1940
FERTILIZER: (Cont'd)						
Superphosphate a (Nat. Fert. Association)						
Production, total	430,810	338,546	435,745	359,890	374,649	345,352
Shipments, total	358,574	231,808	318,712	194,695	299,753	176,928
Northern area	127,120	88,013	157,671	86,089	135,196	71,201
Southern area	231,454	143,795	161,041	108,606	164,557	105,727
Stocks, end of month, total	1,786,112	1,943,182	1,662,143	1,785,445	1,486,673	1,571,998
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	1,272,676	545,772	273,482	183,604	188,830	106,119
Total, 12 southern	1,030,349	520,644	268,704	182,646	186,453	105,003
Total, 5 midwest	242,327	25,128	4,778	958	2,377	1,116
Fertiliser employment *i*	120.0	103.8	105.8	95.0	101.2	92.4
Fertiliser payrolls *i*	118.3	85.5	106.2	80.5	99.1	76.5
GENERAL:						
Acceptances outst'd'g *f*	$197	$212	.....	$208	$193	$196
Coal prod., anthracite, tons	.....	.....	4,118,000	4,671,000	3,832,000	3,980,000
Coal prod., bituminous, tons	.....	.....	46,667,000	40,600,000	42,865,000	40,012,000
Com. paper outst'd'g *f*	$380	$232	.....	.....	$387	$231
Failures, Dun & Bradstreet	.....	.....	.....	.....	842	1,086
Factory payrolls *i*	173.2	120.7	170.2	122.4	165.5	125.1
Factory employment *i*	132.5	115.5	134.3	116.2	134.1	114.2
GENERAL MANUFACTURING:						
Automotive production	238,261	500,878	282,205	483,567	352,347	256,101
Boot and Shoe prod., pairs	.....	.....	.....	.....	34,701,613	36,565,529
Bldg. contracts, Dodge *j*	.....	.....	431,626	456,189	458,620	380,347
Newsprint prod., U. S. tons	.....	.....	81,680	80,837	82,621	85,338
Newsprint prod., Canada, tons.	.....	.....	300,823	252,897	300,308	282,344
Glass containers, gross‡	.....	.....	.....	.....	6,179	4,352
Plate glass prod., sq. ft.	.....	.....	17,491,200	10,310,900	14,276,000	16,059,294
Window glass prod., boxes	.....	.....	.....	.....	1,299,950	1,264,057
Steel ingot prod., tons	7,129,351	6,928,085	7,163,999	6,493,849	6,969,987	6,469,107
% steel capacity	94.7	96.9	98.1	94.1	98.3	96.6
Pig iron prod., tons	4,970,000	4,663,000	5,012,276	4,414,602	4,702,927	4,403,230
U.S. cons'pt. crude rub., lg. tons			No longer Available			
Tire shipments	1,231,422	4,849,748	2,604,022	4,971,504	4,047,913	4,968,533
Tire production	1,368,787	5,486,296	2,967,387	4,998,520	3,964,067	4,731,995
Tire inventories	4,550,068	9,797,253	4,416,640	9,178,537	4,042,995	9,162,995
Cotton consumpt., bales	945,909	844,839	887,326	777,482	849,733	744,088
Cotton spindles oper.	23,077,352	22,829,220	23,063,112	22,799,060	23,069,146	22,685,622
Wool consumption *e*	50.3	46.9	62.3	46.6	51.5	45.8
Rayon deliv., lbs.	41,200,000	35,000,000	39,300,000	34,000,000	38,500,000	34,800,000
Rayon employment *i*	314.5	313.5	321.1	315.1	323.2	314.5
Rayon payrolls *i*	392.0	335.9	391.2	334.4	385.8	331.4
Soap employment *i*	90.8	85.9	92.3	84.8	96.4	84.5
Soap payrolls *i*	132.9	107.7	133.5	106.3	138.5	100.2
Paper and pulp employment *i*	129.5	115.7	129.1	115.9	128.6	115.7
Paper and pulp payrolls *i*	172.3	127.5	169.9	128.5	166.7	123.8
Leather employment *i*	96.4	85.8	98.2	85.8	99.7	83.9
Leather payrolls *i*	119.7	86.7	121.8	89.5	117.8	82.8
Glass employment *i*	128.9	114.4	132.0	116.8	133.3	117.0
Glass payrolls *i*	171.2	131.0	172.2	137.6	169.3	130.8
Rubber prod. employment *i*	100.6	98.8	110.8	97.5	111.5	94.4
Rubber prod. payrolls *i*	134.9	111.6	138.0	111.1	141.0	102.0
Dyeing and fin. employment *i*	133.7	134.9	134.8	134.3	133.1	132.0
Dyeing and fin. payrolls *i*	141.0	120.2	141.1	121.0	132.4	113.5
MISCELLANEOUS:						
Oils & Fats Index ('28 = 100)[1]	.....	.....	143.3	.....	136.9	.....
Gasoline prod., *p*	.....	.....	65,573	52,547	.....	.....
Cottonseed oil consumpt., bbls.	277,038	369,463	238,075	286,624	180,868	289,655
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 630 establishments, dollars	$47,044,491	$34,604,629	$41,708,426	$28,308,153	$41,367,698	$31,892,256
Trade sales (580 estbts.) dollars	$22,842,005	$16,314,158	$18,660,761	$12,520,203	$18,804,182	$15,115,083
Industrial sales, total, dollars	$19,190,138	$15,092,044	$19,199,927	$13,434,963	$18,726,637	$14,048,944
Paint & Varnish, employ. *i*	140.7	126.3	142.2	126.0	142.7	125.9
Paint & Varnish, payrolls *i*	172.8	137.4	176.0	138.7	171.7	135.7

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Chemical Finances
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Dow Nets $6,322,592

The consolidated net income of The Dow Chemical Company and subsidiaries for the nine months ended February 28, 1942 was $6,322,592.21 which, after providing for dividends on the outstanding preferred stock was equivalent to $4.88 per share on the common stock outstanding at February 28, 1942. The net income was arrived at after providing $5,632,872.85 for Federal normal income taxes, surtaxes, and excess profits taxes at an effective rate of tax computed upon the basis of estimated taxable income for the Company's fiscal year ending May 31, 1942.

Included in income for the nine months ended February 28, 1942 were dividends of $1,250,000.00 received from an associated company. During the period, $2,107,474.64 was charged against income for the amortization of completed emergency plant facilities covered by certificates of necessity, the costs of which are being amortized over a period of sixty months as permitted for Federal income and excess profits tax purposes under the Second Revenue Act of 1940.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940	Surplus after dividends 1941	Surplus after dividends 1940
Abbott Laboratories: Year, December 31	$2.15	$2,245,811	$2,239,408	$2.90	$2.89	.....	.....
Air Reduction Co.: Year, December 31	y2.00	7,116,677	6,446,680	2.62	2.38	$1,689,103	$1,022,979
Allied Chemical & Dye Corp.: Year, December 31	k8.00	21,416,566	20,885,270	9.67	9.43	3,703,774	3,172,478
Aluminum Co. of America: Year, December 31	k6.00	40,882,134	46,522,470	22.90	26.73	.....	.....
American Commercial Alcohol: Year, December 31	f...	1,052,122	57,847	4.03	.22	.....	.....
American Cyanamid Co.: Year, December 31	x.60	6,766,292	6,629,729	2.42	2.44	4,776,380	4,824,647
American Smelting & Rfg. Co.: Year, December 31	k3.50	15,742,662	12,735,204	5.59	4.21	4,571,821	3,208,114
Basic Refractories, Inc.: Year, December 31	y.70	450,592	445,890	1.29	1.27	.....	.....
Colgate-Palmolive-Peet Co.: Year, December 31	k1.50	6,604,891	4,283,778	3.09	1.85	3,129,356	1,668,241
Dow Chemical Co.: Nine months, February 28	y3.00	6,322,592	5,819,127	h4.88	h4.92	.....	.....
Eastman Kodak Co.: Year, December 27	y7.00	21,588,790	20,076,739	8.57	7.96	3,886,757	4,850,719
Freeport Sulphur Co.: Year, December 31	2.00	3,149,030	3,033,471	3.95	3.81	1,556,270	1,440,711
General Aniline & Film: Year, December 31	kb.30	4,115,731	4,106,057	b.56	b.55	.....	.....
Heyden Chemical Corp.: Year, December 31	x3.00	1,003,647	807,859	9.04	7.86	.....	.....
Lindsay Light & Chemical Co.: Year, December 31	k.75	107,114	94,431	1.49	1.28	.....	.....
Merck & Co., Inc.: Year, December 31	w.25	3,155,538	2,463,683	h2.88	h7.28	.....	.....
Newport Industries, Inc.: Year, December 31	k.75	707,895	311,230	1.14	.50	241,876	124,822
Parke Davis & Co.: Year, December 31	k1.60	8,006,462	8,187,712	1.64	1.67	172,462	354,933
Union Carbide & Carbon: Year, December 31	k3.00	42,041,624	42,247,274	4.53	4.55	14,208,260	18,588,915
United Chemicals, Inc.: Fifty-three weeks, Jan. 3	f...	294,156	aa170,751	....	....	.....	.....

a On Class A shares; b On Class B shares; c On Combined Class A and Class B shares; d Deficit. f No common dividend; j On average number of shares; k For the year 1940; b On Preferred stock; On Class A shares; y Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; n Preliminary statement; h On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. x Paid on or declared in last 12 months plus extra stock. w Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	Mar. 7	Mar. 14	Mar. 21	Mar. 28	Net gain or loss last mo.	Price on Mar. 29 1941	1942 High	1942 Low
Air Reduction	32¼	31½	31⅞	32⅝	+ ⅜	37⅜	38¼	30½
Allied Chemical & Dye Corp.	127	120	124	125⅛	— 1⅞	154¼	149	119
Amer. Agric. Chem.	20½	20	22⅝	22	+ 1½	14⅝	23⅝	19
Amer. Cyanamid "B"	32	30	31⅜	31⅞	— ⅛	34¼	41⅞	30
Columbian Carbon	62	54	57⅛	61	— 1	77	72	51
Commercial Solvents	8½	8½	8⅜	8⅛	— ⅜	9⅞	9¾	8
Dow Chemical Co.	108	102	98⅝	97⅞	—10⅛	127½	124¼	97
du Pont	113	108⅛	110¼	109	— 4	145⅛	144	108
Hercules Powder	58½	56	57	57½	— 1	71½	72	54
Mathieson Alkali Works	25⅛	23¾	24	23⅝	— 1½	25	29½	28⅛
Monsanto	72¾	70	74	72	— ¾	79	91	68½
Standard Oil of N. J.	34¼	33¾	34	34	— ¼	35⅜	42¼	32⅝
Texas Gulf Sulphur	31½	30⅝	30¾	30¼	— 1¼	35	34⅞	29¾
Union Carbide & Carbon	63	60½	59	59	— 4	65⅞	74¾	58½
United Carbon Co.	41	39¾	40½	40	— 1	...	42⅞	37½
U. S. Industrial Alcohol	29½	28¾	30½	30	+ ½	25	34¼	28

Dividends and Dates

	Per Share	Stock Record	Payable
Air Reduction Co., com. (quar.)	.25	4-4	4-15
Extra	.25	4-4	4-15
Atlas Powder Co., 5% pref. (quar.)	1.25	4-20	5-1
Dow Chemical Co., com. (quar.)	.75	5-1	5-15
5% pref. (quar.)	1.25	5-1	5-15
Hercules Powder Co., 6% pref. (quar.)	1.50	5-4	5-15
Monsanto Chemical Co. $4.50 pref. A (semi-annual)	2.25	5-9	6-1
$4.50 pref. B (semi-annual)	2.25	5-9	6-1
$4.00 pref. C (semi-annual)	2.00	5-9	6-1
Mutual Chemical Co. of America 6% pref. (quar.)	1.50	6-18	6-27
(quar.)	1.50	9-17	9-28
(quar.)	1.50	12-17	12-28
U. S. Smelting, Refining & Mining, com.	1.00	3-28	4-15
7% pref. (quar.)	.875	3-28	4-15

UGI Earns $21,776,714

United Gas Improvement Co. and subsidiaries in report for year ended December 31, 1941, show net income of $21,776,714 after depreciation, interest, amortization, minority interest, subsidiary preferred dividends, federal income taxes, etc., equal after dividend requirements on $5 preferred stock of parent company, to 77 cents a share on 23,252,010 no-par shares of common stock.

This compares with adjusted net income of $27,794,622 or $1.03 a common share in 1940.

Abbott Labs Net $2,245,811

Balance sheet of Abbott Laboratories and subsidiaries show current assets as of December 31, 1941, including $5,029,644 cash and marketable securities, amounted to $15,346,692 and current liabilities were $3,455,716, comparing with cash and marketable securities of $5,421,372, current assets of $12,553,583 and current liabilities of $1,906,548 at end of preceding year. Inventories were $6,842,711 against $4,583,248.

American Cyanamid Nets $2.42 a Share

American Cyanamid Co. and subsidiaries in report for year ended December 31, 1941, certified by independent auditors, show net profit, excluding equity in undistributed earnings of associated companies, of $6,766,292 after depreciation, depletion, interest, provision of $11,457,636 for federal and foreign income and excess profits taxes and $1,000,000 for contingencies. Above net profit is equal after preferred dividends, to $2.42 a share on combined 2,618,364 shares of Class A and B common stocks, excluding 59,679 shares of Class B stock in treasury. Including equity in undistributed earnings of associated companies, net profit was equal to $2.56 a share.

This compares with net profit in 1940 (excluding equity in earnings of associated companies) of $6,629,729 or $2.44 a share on combined Class A and B shares.

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Chemical Finances
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Chemical Stocks and Bonds

PRICE RANGE 1942 March Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
40	49⅞	37¾	55¾	46	70¼	49¼	Abbott Labs.	No	755,204	1.60	2.90	2.89	2.61
32⅝	38¼	30½	45	34⅝	58⅛	36½	Air Reduction	No	2,736,855	2.00	2.62	2 38	1.98
122½	149	119	167½	135	182	135½	Allied Chem. & Dye	No	2,401,288	6.00	9.67	9.43	9.50
22	23⅝	19	22⅞	14⅜	21	12⅛	Amer. Agric. Chem.	No	627,981	1.45	...	1.45	1.22
8⅛	9¾	7½	9⅞	4⅝	8¼	4⅛	Amer. Com. Alcohol	No	260,934	...	4.03	.22	—.38
31¾	35	31½	35	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	...	5.71	3.82
49	70	49	72¼	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
113	116	112	121	111	124¾	112½	5% conv. cum. pfd.	100	68,597	5.00	...	26.01	18.94
17½	21¼	17	29¾	18½	35½	20	Celanese Corp. Amer.	No	1,376,551	2.00	3.43	2.90	3.53
117	120⅜	115	122⅛	116¾	121	105½	prior pfd.	100	164,818	7.00	...	38.69	38.67
11⅞	13⅝	11½	16¼	10⅞	20	10⅛	Colgate-Palm.-Peet	No	1,962,087	0.50	...	1.72	2.74
58	72	51	83	64	98¾	71	Columbian Carbon	No	537,406	4.70	6.57	5.71	5.32
8	9¾	8	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
48	55¾	47	55¾	42¼	65⅛	40¼	Corn Products	25	2,530,000	3.00	3.37	3.10	3.32
169	174	164	182½	164	184	165	7% cum. pfd.	100	245,738	7.00	...	7.23	7.70
16¾	21	14	21	12¼	23¾	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
98	124⅛	97	141⅜	111⅛	171	127¼	Dow Chemical	No	1,135,187	3.00	...	6.65	3.76
107¼	144	103	164¾	125⅛	189¼	146½	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
121¾	126½	121	127	120⅞	129⅜	114	4½% pfd.	No	1,688,850	4.50	...	51.48	52.25
116½	141	115	145½	120¼	166¾	117	Eastman Kodak	No	2,488,242	6.00	...	7.96	8.55
170	176	170	182½	160	180	155	6% cum.	100	61,657	6.00	...	325.62	337.65
35	38¾	32⅞	41	32½	39¼	24¾	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
5	5⅝	4⅞	7½	4⅞	10	5½	Gen. Printing Ink	1	735,960	0.65	...	.86	.94
14⅛	15	12½	17⅞	11	19¾	11	Glidden Co.	No	829,989	1.50	...	1.56	1.70
40½	44	37¾	46	35	45	30	4½% cum. pfd.	50	199,940	2.25	...	8.64	9.27
81¼	93½	81	96	76	113¼	89⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
56	72	54	80¼	65¼	100½	69	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
128	128	125	132½	123½	133½	126¼	6% cum. pfd.	100	96,194	6.00	...	66.38	60.87
24	27	24	29⅞	20¾	29	16⅝	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
22	23½	19¾	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.10
105	111½	105	113¼	107	113	91	6% pfd.	100	65,661	6.00	...	16.99	24.27
2¼	3	2⅛	2⅜	1	2½	1	Intern. Min. & Ch.	No	436,048	...	...	—1.57	—1.32
57	60	48	53½	30⅛	44	18⅛	7% cum. pfd.	100	100,000	...	...	.14	1.26
26⅞	28¾	25½	31⅜	23	38⅞	19⅜	Intern. Nickel	No	14,584,025	2.00	2.22	2.30	2.39
40	48¼	39	49	38¼	39⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
19¼	20¾	18½	22	17¼	23¾	14⅜	Kellogg (Spencer)	No	509,213	1.70	...	...	1.39
21⅝	23⅜	20½	45⅜	19⅛	53⅜	30	Libbey Owens Ford	No	2,513,258	3.50	...	3.97	3.21
13⅛	15½	12⅝	16⅝	13	18⅝	10⅛	Liquid Carbonic	No	700,000	1.00	...	1.72	1.62
23⅛	29½	23⅛	31¼	24⅛	32⅜	21	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
70¾	91	68⅛	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.90	4.04	3.81
112¼	117½	112¼	118½	112	119	110	4½% pfd. A.	No	50,000	4.50	...	57.38	54.29
116	119	116	123	115	122	113½	4½% pfd. B.	No	50,000	4.50	...	57.38	54.29
106⅛	110¾	106⅛	113½	108⅞	...	...	4 % pfd. C.	No	50,000	4.50	...	...	...
13⅝	16¼	12½	19¼	12¼	22½	14⅛	National Lead	10	3,090,664	0.50	1.10	1.34	1.23
168	176	166½	176	100½	176	160	7% cum. "A" pfd.	100	213,793	7.00	...	28.54	27.04
130	146	129	154	138	153¾	132	6% cum. "B" pfd.	100	103,277	6.00	...	59.46	55.30
32½	35	32	36	26	44	28¾	National Oil Products	4	179,829	1.95	4.11	3.92	3.89
8⅝	11⅞	8⅛	11⅞	5⅜	14¼	6⅛	Newport Industries	1	621,359	0.75	1.14	0.50	0.66
46	54	44½	54	38¾	64⅝	42	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
44¼	52	42	61½	47½	71¾	53	Procter & Gamble	No	6,409,418	2.00	...	4.37	3.80
118	119	115	120	115	118½	112½	5% pfd.	100	169,517	5.00	...	336.78	298.55
10⅝	14¾	10¼	16¾	10⅛	13⅛	7⅝	Shell Union Oil	No	13,070,625	1.00	...	1.05	0.77
23½	28½	22¼	35¼	18⅞	23¾	12¼	Skelly Oil	No	981,349	1.50	...	3.28	1.99
21⅛	27½	21	34⅛	24⅞	29	20⅝	S. O. Indiana	25	15,272,020	1.00	...	2.20	2.24
33⅝	42¼	32⅝	46⅞	33	46½	29⅞	S. O. New Jersey	25	27,278,666	1.00	...	4.54	3.27
8⅛	9⅜	8	9⅜	6	9¼	4¼	Tenn. Corp.	5	853,696	1.00	1 60	1.36	0.41
31	39¼	30¼	46⅜	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	4.77	2.90	3.02
30	34⅞	29⅝	38⅞	30⅛	37¼	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	...	2.38	2.04
58½	74¾	58½	79⅞	60	88⅜	59⅞	Union Carbide & Carbon	No	9,277,288	3.00	4.53	4.55	3.86
40	42⅞	37½	52	35	65⅝	42½	United Carbon	No	397,885	3.00	...	3.36	3.81
30	34¼	28	34¼	20	28	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
17¼	20⅞	17	34⅛	15½	43⅞	25	Vanadium Corp. Amer.	No	405,706	1.50	3.03	2.85	3.25
22¼	25½	21	27¼	20	31½	14	Victor Chem.	5	696,000	1.40	...	1.45	1.59
1¾	2¼	1	2½	¾	4⅛	1¾	Virginia-Caro. Chem.	No	486,122	...	...	—1.36	—1.57
27	29½	22½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213,052	1.00	...	2.89	2.41
25	31½	22	36½	27¼	38½	27¾	Westvaco Chlorine	No	553,132	1.85	2.92	2.96	2.91
106	106½	103¼	112	105	109⅞	108	cum. pfd.	No	59,885	4.50	...	21.98	...
NEW YORK STOCK EXCHANGE													
31¼	41⅞	30	42⅜	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	2.42	2.44	2.07
7¼	7¼	6⅞	7¾	6⅜	8⅛	5	Duval Texas Sulphur	No	500,000	1.25	...	1.16	1.25
80	88½	74½	99	65	92	60	Heyden Chem. Corp.	100	104,983	3.00	9 04	7.86	5.98
56	63	55¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	...	6.30	4.94
65¼	70	62	84	61	100	62½	Sherwin Williams	25	638,927	3.00	...	6.57	5.96
111½	113	110	115½	108½	114¾	106	5% cum. pfd.	50	122,289	5.00	...	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
149	175½	135	185	162	192	158¾	Pennsylvania Salt	50	150,000	8.00	...	...	10.52

PRICE RANGE 1942 March Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
103¾	104¼	101¾	104½	100¾	105¼	100⅛	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
35	40¼	34	42¼	26⅛	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
36½	40	35	40	25⅜	39¾	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
97¼	97⅞	95¾	99⅞	94¾	100¼	93½	Shell Union Oil	1954	2½	J-J	85,000,000
104½	105⅜	103½	106⅜	102½	107	101⅛	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
105⅛	105⅛	103¾	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
105¾	105¾	104½	107¾	102⅞	108¼	102	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.

New Trade Marks of the Month

DIVERSEY DISC DIP
394,386

S P
413,589

424,518

"EEE-ZEE-WASH"
428,635

Hollywood BUBBOBATH
429,549

AUROL
440,509

SIRSALVE
443,366

MICATEX
444,974

SafeWay
445,088

BIOFILAN
445,352

KERATOGEN
445,548

GRAS
445,919

446,150

SEMTEX
446,469

HEPS
446,572

Dearborn
447,012

L. I. B.
448,419

Filmonize
448,475

THE GREAT WESTERN
448,633

Cremoline
448,743

SHINEX
448,752

WHITEX
448,753

PRIORITY
448,823

TEEM
448,978

SOFTENS, CLEANS, BLUES
RAIN DROPS
449,036

Golden Center
449,081

HYDRO-MAGMA
449,252

VELVET SUDS
449,294

DIRT-FOE
449,296

449,389

ENCOLOID
449,498

AG-O-SYL
439,500

ENZILE
439,504

DEROCIDE
449,705

LEATHEROL
449,794

B-CLYSOL
449,875

EXCELSIOR
449,894

EXCELSIOR
449,895

ESCO
WAX SOLVENT
449,959

QUINTONE
450,000

Trade Mark Descriptions †

394,386. The Diversy Corp., Chicago, Ill.; Aug. 21, '40; for disinfectant compound in powdered form, having incidental cleansing properties, for disinfecting and cleaning receptacles and containers; since July 10, '40.

413,589. McKesson & Robbins, Inc., Bridgeport and Fairfield, Conn.; Dec. 8, '38; for preparation for the relief of burns, prickly heat, sunburn, scalds, and all raw and irritated skin surfaces; since July 29, '16.

424,518. Claude H. Hoover (C-Lite Chemical Products), Goshen, Ind.; Oct. 13, '39; for liquid preparation for cleaning and polishing glass and metal; since Aug. 28, '37.

428,635. Joseph C. Shepard, Wilmington, N. C.; Feb. 17, '40; for washing powder; since Dec. 31, '37.

429,549. The Bubbobath Company, Minneapolis, Minn.; Mar. 13, '40; for a chemical water softener and foaming agent; since Dec. 6, '38.

439,252. Marine Magnesium Products Corp.; South San Francisco, Calif.; Dec. 28, '40; for magnesium hydroxide paste; since Apr. 5, '33.

439,500. United Cigar-Whelan Stores Corp., New York, N. Y.; Jan. 8, '41; for intestinal lubricant; since May 10, '40.

439,504. United Cigar-Whelan Stores Corp., New York, N. Y.; Jan. 8, '41; for laxative; since Aug. 10, '40.

440,509. Hille Laboratories, Chicago, Ill.; Feb. 10, '41; for colloidal gold and colloidal gold compounds for carcinomatous conditions, tuberculosis, syphilis, arthritis, whooping cough, and other spasmodic conditions, chronic alcoholism, etc.; since '12.

443,366. John H. Leonard (Leonard Laboratories), Merkel, Tex.; May 8, '41; for salve used as an external treatment for cancer, eczema, and chronic skin infections; since Apr. 21, '41.

444,974. National Lead Co., New York, N. Y.; June 30, '41; for mica product comprising mica in comminuted form for use in the preparation and treatment of well drilling fluids; since Feb. 17, '41.

445,088. Double Duty Products, Inc. (Safeway Chemical Co.), Cleveland, O.; July 5, '41; for cleansing fluids; since July, '34.

445,352. Joseph Cortez (Colloid's Research Company), New York, N. Y.; July 15, '41; for multiple vitamin compounds combined with chlorophyll in capsule and/or tablet form; since Feb. 15, '41.

445,548. Franklin Laboratories, Inc., Hackettstown, N. H.; July 22, '41; for pharmaceutical preparation used in the treatment of skin diseases and ailments; since July 1, '41.

445,919. Cerophyl Laboratories, Inc., Kansas City, Mo.; Aug. 4, '41; for therapeutic vitamin preparation used as a food supplement for pets; since June 11, '41.

446,150. Stewart-Warner Corp., Chicago, Ill.; Aug. 11, '41; for die castings of nonferrous metal principally of aluminum alloys; since Jan. 1, '23.

446,469. Semtex, Ltd., Reading, England; Aug. 22, '41; for compositions of cement and latex for use in fixing rubber flooring, for joining wood and metal surfaces, and for similar adhesive purposes; since March, '36.

446,572. The Heneph Corp., New York, N. Y.; Aug. 27, '41; for medicinal tablet for the relief of stomach distress; since March, '41.

447,012. Dearborn Chemical Co., Chicago, Ill.; Sept. 13, '41; for boiler compound; since Nov. 21, '19.

448,419. Physicians Pharmacal Company, Oklahoma City, Okla.; Nov. 5, '41; for tonic capsule; since July 5, 41.

448,475. International Plastic Corporation, Chicago, Ill.; Nov. 8, '41; for transparent pressure-sealing adhesive tape; since Sept. 26, '41

448,633. Charles G. Enge also (Western Chemical Co.), New York, N. Y.; Nov. 14, '41; for insecticides; since Apr. 10, '03.

448,743. Louis C. Travand (Louis C. Traband Company), East St. Louis, Ill.; Nov. 18, '41; for disinfectants, insect exterminators, stock dip and chemical solution for cleaning pipes; since 1890.

448,752. Harold Blank, Brooklyn, N. Y.; Nov. 19, '41; for shoe cleaning preparation; since Oct. 31, '41.

448,753. Harold Blank, Brooklyn, N. Y.; Nov. 19, '41; for shoe cleaning preparation; since Oct. 31, '41.

448,978. Miracle Industries, Chicago, Ill.; Nov. 27, '41; for synthetic form of substitute soap for general washing purposes; since Sept. 3, '41.

449,036. Bu-Tay Products, Inc., Huntington Park, Calif.; Nov. 29, '41; for combination washing blueing, and water softener; since June 8, '40.

449,081. Mother Hubbard Distributors, Inc., New York, N. Y.; Dec. 1, '41; for wheat germ; since Nov. 14, '41.

449,294. The Procter & Gamble Co., Cincinnati, O.; Dec. 8, '41; for soap; since Oct. 17, '41.

449,296. Jay Rose, New York, N. Y.; Dec. 8, '41; for chemical preparations for cleaning painted surfaces; since Oct., '40.

449,389. Peacock Laboratories, Inc., Philadelphia, Pa.; Dec. 11, '41; for liquid adhesive having a shellac base prepared especially for attaching cork, felt, cardboard, or similar materials to the backs of mirrors; since Nov. 3, '41.

449,498. Neuberg Chemical Corp., New York, N. Y.; Dec. 15, '41; for lecithin and lecithin containing compounds; since Nov. 27, '41.

449,705. Stauffer Chemical Co., San Francisco, Calif.; Dec. 22, '41; for insecticides; since Sept. 1, '33.

449,794. Franklin E. Everson (F. E. Everson), New York, N. Y.; Dec. 27, '41; for preparation for preserving leather; since Dec. 15, '41.

449,875. Abbott Laboratories, North Chicago, Ill.; Dec. 31, '41; for medicinal preparation in liquid form for replacing body fluids and supplying necessary vitamins by venoclysis; since Dec. 18, '41.

449,894. Columbian Carbon Co., New York, N. Y.; Dec. 31, '41; for particulate carbon having a general use in the industrial arts; since Aug. 1, '33.

449,895. Columbian Carbon Co., New York, N. Y.; Dec. 31, '41; for particulate carbon for use as a paint pigment; since Aug. 1, '33.

449,959. The Embalmers' Supply Co., Westport, Conn.; Jan. 2, '42; for preparation for the softening of waxes and wound fillers

† Trademarks reproduced and described include those appearing in the *Official Gazette* of the *U. S. Patent Office*, March 10 to 31.

New Trade Marks of the Month

ORIDX
450,006

LINDOX
450,007

Fuld Defense
450,011

MEADOL
450,018

TANALGINATE
450,046

CASCOLA
450,174

DIOKON
450,198

SPRAYLAT
450,213

KYS-WARF
450,280

Graslets
450,304

Vitabolin
450,305

PHENO-DRENCH
450,348

CELLUFLEX
450,392

DENTROX
450,399

ENTROX
450,400

PYRAN
450,401

MEXSANA
450,456

MYALETE
450,466

(B. T. V.)
450,472

(Pelmenal)
450,473

NEO-MAPHARSEN
450,489

DICHLOR-MAPHARSEN
450,490

COUMADIN
450,506

AIRCO
450,527

ANIM-A
450,533

PABA
450,560

PABANA
450,561

SULFADRINE
450,576

TRIBIN
450,584

ZIPACEL
450,610

LUASMIN
450,614

B-1956
450,744

HYDROCLEAN
450,685

KLENZINE
450,686

P C
450,689

BARBISODITE
450,783

Enterdigalis
450,784

PHENALCO
450,785

PROPALCAIN
450,787

VICALIRON
450,791

VITACHOLINE
450,792

PABANOL
450,848

WITCARB
450,872

Theodigital
450,874

CALPANATE
450,893

particularly adapted for use in the embalming trade; since Apr. 25, '41.

450,000. K. J. Quinn & Co., Inc., Boston, Mass.; Jan. 5, '42; for leather cleaning and polishing preparation; since Dec. 2, '41.

450,006. The Linde Air Products Company, New York, N. Y.; Jan. 3, '42; for oxygen; since Sept. 9, '38.

450,007. The Linde Air Products Company, New York, N. Y.; Jan. 3, '41; for oxygen; since Aug. 4, '39.

450,011. Fuld Bros., Baltimore, Md.; Jan. 6, '42; for disinfectants; since Nov., '41.

450,018. The Mead Corp., Chillicothe, O.; Jan. 6, '42; for resinous material; since Nov. 5, '37.

450,046. The Bird-Archer Co., New York, N. Y.; Jan. 7, '42; for preparation used to condition water used in boilers in the generation of steam; since Sept., '41.

450,174. The Borden Company, New York, N. Y.; Jan. 13, '42; for label glue; since Dec. 27, '41.

450,198. Charles E. Frpsst & Co., Montreal, Canada, and Richmond, Va.; Jan. 14, '42; for preparation for the treatment of vitamin K deficiency; since Feb. 27, '40.

450,213. Shoe Covers Corp., New York, N. Y.; Jan. 14, '42; for rubber or latex in solution or aqueous suspension; since June, '39.

450,280. Keyes Fibre Company, Waterville, Maine; Jan. 17, '42; for resin-bearing fibrous articles; since Nov. 27, '41.

450,304. Cerophyl Laboratories, Inc., Kansas City, Mo.; Jan. 19, '42; for therapeutic vitamin preparation used as a food supplement for pets; since Sept. 26, '41.

450,305. Melvin N. Creal (Vitabolin Co.), Dover, O.; Jan. 19, '42; for linseed oil capsules containing vitamins A and B; since Nov. 4, '41.

450,348. Ferd Staffel Co., San Antonio, Tex.; Jan. 20, '42; for medicinal preparation; since Sept., '40.

450,401. Monsanto Chemical Co., St. Louis, Mo.; Jan. 22, '42; for monocalcium phosphate and other chemicals; since Jan. 14, '42.

450,456. Plough, Inc., Memphis, Tenn.; Jan. 24, '42; for soothing, cooling and astringent powder; since Jan. 13, '42.

450,466. Abbott Laboratories, North Chicago, Ill.; Jan. 26, '42; for anti-mycotic powder; since Jan. 20, '42.

450,472. Cutter Laboratories, Berkeley, Calif.; Jan. 26, '42; for mixed bacterin; since Dec. 15, '40.

450,473. Cutter Laboratories, Berkeley, Calif.; Jan. 26, '42; for mixed bacterin for the prevention and treatment of respiratory infections in cattle; since Dec. 15, '40.

450,489. Parke, Davis & Co., Detroit, Mich.; Jan. 26, '42; for preparation used in the treatment of syphilitic and related types of infection; since Jan. 7, '42.

450,490. Parke, Davis & Co., Detroit, Mich.; Jan. 26, '42; for preparation used in the treatment of syphilitic and related types of infection; since Jan. 7, '42.

450,392. Celanese Corp. of America, New York, N. Y.; Jan. 22, '42; for chemical substance or mixture in liquid form but which may be in solid crystal, or in any other form; since Aug. 28, '39.

450,399. McDonald Biochemic Laboratories, Ltd., Toronto, Ontario, Canada; Jan. 22, '42; for oral prophylactic; since Nov. 30, '40.

450,400. McDonald Biochemic Laboratories, Ltd., Toronto, Ontario, Canada; Jan. 22, '42; for medicinal preparation; since May 14, '40.

450,506. Endo Products, Inc., New York, N. Y.; Jan. 27, '42; for hemorrhagic producing drug; since Aug. 1, '41.

450,527. Air Reduction Sales Co., New York, N. Y.; Jan. 28, '42; for rare gases; since Nov., '20.

450,533. California Packing Corp., San Francisco, Calif.; Jan. 28, '42; for fish liver oil containing vitamin A; since Sept. 26, '40.

450,560. American Home Products Corp., Jersey City, N. J.; Jan. 29, '42; for p-aminobenzoic acid; since Sept. 19, '41.

450,561. American Home Products Corp., Jersey City, N. J.; Jan. 29, '42; for p-aminobenzoic acid; since Sept. 19, '41.

450,576. Smith, Kline & French Laboratories, Philadelphia, Pa.; Jan. 29, '42; for medicinal preparation; since Jan. 19, '42.

450,584. Endo Products, Inc., New York, N. Y.; Jan. 30, '42; for preparation consisting of a combination of vitamins; since Sept. 1, '41.

450,610. Allied Chemical & Dye Corp., New York, N. Y.; Jan. 31, '42; for chemical preparation for use in the vulcanization of rubber; since Sept. 12, '41.

450,614. Brewer & Co., Inc., Worcester, Mass.; Jan. 31, '42; for capsules and enteric coated tablets; since Apr. 21, '39.

450,685. W. H. Plunkett (Plunkett Chemical Co.), Chicago, Ill.; Feb. 3, '42; for solvent; since June 1, '10.

450,686. W. H. Plunkett (Plunkett Chemical Co.), Chicago, Ill.; Feb. 3, '42; for drain pipe cleaner; since June 1, '30.

450,689. W. H. Plunkett (Plunkett Chemical Co.), Chicago, Ill.; Feb. 3, '42; for disinfectant, insecticide; on disinfectants and insecticides since about June 1, '08; on solvent since about June 1, '10; on disinfectant since about June 1, '20; and on skin conditioner since about June 1, '41.

450,744. Rohm & Haas Co., Philadelphia, Penna.; Feb. 4, '42; for chemical composition to be used as an emulsifying, spreading, sticking and/or extending agent; since Jan. 7, '42.

450,791. Chicago Pharmacal Company, Chicago, Ill.; Feb. 6, '42; for preparation to supply iron, calcium, phosphorus and vitamin D; since May 13, '40.

450,783. Chicago Pharmacal Company, Chicago, Ill.; Feb. 6, '42; for preparation for use in controlling hypertension; since Sept. 3, '35.

450,784. Chicago Pharmacal Co., Chicago, Ill.; Feb. 6, '42; for preparation of digitalis for use in treatment of cardiac conditions requiring digitalis; since Feb. 3, '36.

450,785. Chicago Pharmacal Co., Chicago, Ill.; Feb. 6, '42; for antiseptic and germicide; since March 12, '35.

450,787. Chicago Pharmacal Co., Chicago, Ill.; Feb. 6, '42; for pharmaceutical preparation for rectal anesthesia; since Aug. 22, '39.

450,792. Chicago Pharmacal Co., Chicago, Ill.; Feb. 6, '42; for epithelial stimulant used in the treatment of ulcers; since July 2, '36.

450,848. Endo Products, Inc., New York, N. Y.; Feb. 9, '42; for soluble form of para amino benzoic acid; since Oct. 1, '41.

450,872. Wishnick-Tumpeer, Inc., Chicago, Ill.; Feb. 9, '42; for precipitatic calcium carbonate; since Sept., '40.

450,874. The Drug Products Co., Inc., Long Island City, N. Y.; Feb. 10, '42; for theobromine and digitalis preparation in tablet form; since Oct. 9, '35.

450,893. F. D. Buxton, Inc., Baltimore, Md.; Feb. 11, '42; for medicinal drug in the vitamine field; since Feb. 6, '42.

War Regulations
Priorities, Allocations, Import and Price Controls—p. 21

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to Feb. 28, 1942. This month new regulations are brought up to March 31, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Aluminum

Mar. 11, 1942. WPB Order M-1-g, effective immediately, places aluminum pigment and paint under complete allocation system.

Mar. 12, 1942. Suspension orders issued by WPB against two midwest users of aluminum scrap who, by entering into unauthorized toll agreement, violated Conservation orders M-1-a and M-1-c.

Mar. 20, 1942. Preference rating of A-1-j granted producers and basic fabricators of aluminum and magnesium on orders for repair, maintenance and operating supplies. These are applicable only when specifically assigned to individual company with a serial number.

Mar. 23, 1942. Acting Price Administrator John E. Hamm suggests proper maximum prices for several grades of segregated solid aluminum alloy scrap not presently covered by Price Schedule No. 2.

Antimony

Mar. 23, 1942. OPA requests producers and producers' agents not to make sales at more than 14½ cents per lb. for standard grade, bulk carload lots, f. o. b. Laredo, Texas.

Mar. 30, 1942. General Preference Order M-112 places allocation control over antimony.

Asbestos

Mar. 31, 1942. Conservation Order M-123 prohibits manufacturers from making deliveries of asbestos textiles except for use in manufacture of industrial packings, or to fill orders bearing a preference rating of A-10 or higher.

Babassu Oil

Mar. 20, 1942. General Preference Order M-60, restricts use.

Mar. 31, 1942. General Preference Order M-60 was published in Federal Register with an improperly assigned Part and Section Number.

To avoid confusion with another order previously issued, M-60 has been corrected by assignment of "Part 1037 and Sec. 1037.1" in place of "Part 1032 and Sec. 1032.1" as published in Federal Register on March 21.

Cadmium

Mar. 16, 1942. General Imports Order M-63 amended to remove restrictions on importations of cadmium, zinc ores and concentrates, lead ores and concentrates, and copper ores and concentrates. Seven other commodities were added to list under control by amendment.

Chlorinated Solvents

Mar. 2, 1942. Use of chlorinated solvents by metal fabricators must be carefully conserved.

Mar. 30, 1942. General Preference Order M-41 extended to May 15. Solvents limited by this order are carbon tetrachloride, trichlorethylene, perchlorethylene, and ethylene dichloride.

Chlorine

Mar. 9, 1942. WPB announces that because of delay in printing Form PD-277, Amendment No. 1 to General Preference Order M-19 will not go into effect until April, 1942.

Mar. 30, 1942. WPB announces that Chlorine Order M-19 to become effective April 1, is postponed to May 1 because of complexity of forms in connection with uses out of proportion to amount of chlorine used in the industries concerned.

Chromium

Mar. 26, 1942. Order M-18-b issued by WPB limits use of chromium in manufacture of roofing materials, ceramics, soap, glass, chromic acid, leather tanning, and wood preservation.

Cocoanut Oil

Mar. 20, 1942. General Preference Order M-60, restricts use.

Mar. 31, 1942. General Preference Order M-60 was published in Federal Register with an improperly Assigned Part and Section Number.

To avoid confusion with another previously issued, M-60 has been corrected by assignment of "Part 1037 and Section 1037.1" in place of "Part 1032 and Section 1032.1" as published in the Federal Register on March 21.

Copper

Mar. 3, 1942. Proposed preference rating of A-9 for replenishing stocks of copper and copper products by warehouses revoked by WPB.

Mar. 14, 1942. Railroad scrap which is reprocessed under conversion agreements approved by WPB is excepted from Revised Price Schedule No. 20 in Amendment No. 2.

Amendment is retroactively effective to Feb. 27, 1942, date on which Price Schedule No. 20 was amended to impose maximum prices on copper alloy scrap.

Mar. 16, 1942. General Imports Order M-63 amended to remove restrictions on importations of cadmium, zinc ores and concentrates, lead ores and concentrates, and copper ores and concentrates. Seven other commodities were added to list under control by amendment.

Mar. 17, 1942. Amendment No. 2 to revised Price Schedule No. 20 corrected as follows: In the text, section 1309.61(B), line three should read "A person owning, operating or maintaining rolling stock of copper scrap and copper alloy scrap," instead of "A person owning, operating or maintaining rolling stock, or copper scrap and copper alloy scrap."

Mar. 20, 1942. Division of Industry Operations to investigate scrap dealers and foundries to determine inventories and degree of compliance with conservation order.

Mar. 27, 1942. Allocation of Copper to Rural Electrification Administration stopped, thus preventing any non-defense construction by that administration.

Dyestuffs

Mar. 30, 1942. Conservation Order M-103 sets aside 10 dyes for use in manufacture of military uniforms. Colors range from orange and yellow to brown, khaki and olive drab.

Enamels

Mar. 23, 1942. Conservation Order M-108 provides that oils, lacquers, enamels, resins, and gums shall no longer be used as exterior coatings on cans made of tinplate or terneplate, unless the coating serves a particularly useful purpose. Exceptions are listed.

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Fats and Oils

Mar. 20, 1942. General Preference Order M-60 restricts use of cocoanut oil, babassu oil and other oils with high lauric acid content.

Mar. 31, 1942. General Preference Order M-60 was published in Federal Register with an improperly Assigned Part and Section Number.

To avoid confusion with another previously issued, M-60 has been corrected by assignment of "Part 1037 and Section 1037.1" in place of "Part 1032 and Section 1032.1" as published in the Federal Register on March 21.

Fertilizers

Mar. 19, 1942. Price Schedule No. 108, effective March 23, establishes maximum margins for nitrate of soda, sulfate of ammonia, and cyanamide mixers and dealers. Maximum margins for cash sales of the three fertilizers, direct or through agents to consumers, at $4.00 per ton, maximum margins for cash sales to dealers at $2.00 per ton and dealers' margins on cash sales to consumers at $2.00 per ton.

Mar. 16, 1942. Amendment No. 6 to Order M-25 grants preference rating of B-3 to assist embalmers to obtain formaldehyde.

Amounts to be obtained by embalmers are limited by calendar quarters, to one-fourth the amount they used for year 1940.

Glycerine

Mar. 30, 1942. General Preference Order M-58, effective at once places under allocation control all deliveries of glycerine in excess of 50 lbs. a month. Deliveries for war orders and for manufacture of health supplies are excepted.

Graphite

Mar. 25, 1942. Interpretation of Conservation Order M-61 issued to make clear to manufacturers and dealers the type of Madagascar Flake Graphite covered therein.

The order deals with "Madagascar flake graphite which is of the grade that can be used for the manufacture of crucibles." This is interpreted to mean "Madagascar flake graphite of a grade that will stand on a 35-mesh screen."

Iron Ore

Mar. 20, 1942. OPA plans price ceiling for Lake Superior iron ore shipped in 1942 season.

Lead

Mar. 14, 1942. Eastern producers of fabricated lead products to meet March 16, 1942 with OPA officials to discuss plans for permanent ceiling.

Mar. 19, 1942. Western producers of lead and tin products to meet March 23 and 24 in Chicago with OPA officials to discuss plans for price ceilings.

Magnesite, Grain

Mar. 6, 1942. Amendment No. 1 to Revised Price Schedule No. 75 permits some sales at higher prices than the established maximums.

Magnesium

Mar. 20, 1942. Preference rating of A-1-j granted producers and basic fabricators of aluminum and magnesium on

Lithopone

Revised Price Schedule No. 80

Issued Jan. 28, 1942; Effective Feb. 2, 1942

§ 1335.651 *Maximum prices for lithopone.* On and after February 2, 1942, regardless of the terms of any contract of sale or purchase, or other commitment, no person shall sell, offer to sell, deliver or transfer lithopone, and no person shall buy, offer to buy or accept delivery of lithopone at prices higher than the maximum prices set forth in Appendix A, incorporated herein as § 1335.659.

§ 1335.659 *Appendix A: Maximum prices for lithopone.* The following maximum prices are established for lithopone:

(a) *Deliveries in Eastern Territory**

Grade	Per pound delivered in bags: Carload lots	Per pound delivered in bags: Less than carload lots
Normal	$0.0425	$0.0450
High Strength Barium	.0560	.0585
High Strength Calcium	.0560	.0585
High Strength Magnesium	.0575	.0600
Titanated	.0560	.0585
Zinc Sulphide	.0825	.0850

(b) *Deliveries in Western Territory**

Grade	Per pound delivered in bags (carload lots)	Per pound f. o. b. warehouse (less than carload lots)
Normal	$0.0450	$0.0475
High Strength Barium	.0585	.0610
High Strength Calcium	.0585	.0610
High Strength Magnesium	.0600	.0625
Titanated	.0585	.0610
Zinc Sulphide	.0850	.0875

* When used in this Appendix, the term "Eastern Territory" means the States of New Mexico, Colorado, Wyoming, Montana, and all States east thereof, and the term "Western Territory" means all other States of the United States.

(c) *Barrels.* The maximum prices for deliveries of lithopone in Eastern or Western Territory in barrels are the maximum prices established above in paragraphs (a) or (b), whichever the case may be, plus one quarter of a cent per pound.

(d) *Export Sales and Sales to Persons in Territories and Possessions of the United States—(1) Shipments by vessel from Eastern Territory.* The maximum prices for shipment by vessel from Eastern Territory are the maximum prices established above in paragraph (a) f. a. s. vessel at the port of shipment plus $.30 per hundred pounds.

(2) *Shipments by vessel from Western Territory.* The maximum prices for shipment by vessel from Western Territory are the maximum prices established above in paragraph (b) f. a. s. vessel at the port of shipment plus $.30 per hundred pounds.

(3) *Overland shipments.* The maximum prices for overland shipment are the maximum prices established in paragraph (a) or (b) above, whichever the case may be, delivered to that station in the United States which is at or nearest to that point on the boundary at which the shipment crosses from the United States into Canada or Mexico plus $.20 per hundred pounds except that for less than carload quantities shipped from warehouses in Western Territory the maximum prices are f. o. b. warehouse plus $.20 per hundred pounds.

(4) *Expenses.* No expenses, commissions, or charges for service may be added to the maximum prices established by subparagraphs (1), (2) and (3) of this paragraph (d), except (i) ocean freight, (ii) marine and war risk insurance, and (iii) foreign agents' commission unless such foreign agents' commission or any part thereof is received by the exporter directly or indirectly for his own use.

Lithopone

Amendment No. 1 to Revised Price Schedule No. 80

Issued Feb. 27, 1942; Effective Feb. 27, 1942

Section 1335.659 is hereby amended by the addition thereto of a new paragraph (e), and a new § 1335.658 A, is added as set forth below:

§ 1335.659 *Appendix A: Maximum prices for lithopone.*

* * * * * *

(e) *Pre-existing contracts.* On and after February 2, 1942, any dealer or exporter who was not engaged in manufacturing lithopone or engaged in any other manufacturing activity, prior to such date, and who, prior to February 2, 1942, had lithopone on hand or in the hands of a carrier or warehouse, other than a carrier or warehouse owned and controlled by the person from whom such lithopone was purchased, in order to meet a contract of sale made prior to February 2, 1942, may deliver such lithopone in accordance with the terms of such contract; and any dealer or exporter to whom such delivery of lithopone is made and who had entered into a contract for the sale thereof prior to February 2, 1942, may deliver such lithopone in accordance with the terms of such contract: *Provided,* That, any dealer or exporter making a delivery of lithopone pursuant to this paragraph shall, within 10 days after such delivery submit to the Office of Price Administration, Washington, D. C., a verified statement, setting forth: (1) the date upon which he received delivery of such lithopone or the date upon which such lithopone had been received by the carrier or warehouse; (2) the name and address of his supplier; (3) the name and address of the purchaser; (4) the date upon which the contract of sale was made; (5) the form of the contract, i. e. oral, exchange of letters, order form, signed agreement, etc.; (6) the quantity of lithopone which the dealer had on hand, or in transit, on February 2, 1942; (7) the quantity of lithopone delivered under the contract of sale after February 2, 1942, and the date or dates of such delivery; and (8) the selling price.

§ 1335.658a *Effective dates of amendments.* Amendment No. 1 (§§ 1335.659 (e) and 1335.658a) to Revised Price Schedule No. 80, shall become effective February 27, 1942. (Pub. Law 421, 77th Cong., 2d Sess.)

orders for repair, maintenance, and operating supplies. These are applicable only when specifically assigned to individual company with a serial number.

Mercury Compounds

Mar. 3, 1942. Producers requested by OPA to maintain for sixty days the prices in effect on February 14, 1942.

Mercury

Mar. 19, 1942. Dealers in prime virgin mercury may split the 2% premium allowed them under Price Schedule No. 93 with other dealers or brokers, provided this does not result in producer obtaining more than the applicable maximum price.

Methanol

Mar. 31, 1942. Amendment No. 4 issued to facilitate operation of General Preference Order M-31. Shipments of methyl alcohol to be used in manufacture of formaldehyde for uses in Classification I of Order M-25 (largely industrial users) are granted preference rating of B-2. Shipments for uses in Classification II (largely plastics for civilian use) are granted rating of B-3.

In all cases of quantity restrictions, restrictions are changed from a monthly basis to a quarterly basis to facilitate economy in shipments.

Persons who require less than 55 gallons of methyl alcohol a month are exempted from the restrictions and requirements set forth in order.

Molybdenum

Mar. 24, 1942. Consumers of molybdenum notified that, because of lack of time, General Preference Order M-110 which calls for complete allocation system will not be placed in effect in April.

Requests for delivery of molybdenum must be received by WPB by 20th of preceding month, and complete working of the Order will take effect May 1.

For remainder of March and April, following rules to be observed: No order should be placed or accepted which will increase customer's minimum working inventory.

Shipments during March or April should not exceed shipments made to same customer during either January or February, whichever was the greatest. If such an amount already has been shipped for March no further shipments should be made for the month.

No deliveries of molybdenum should be made before May 1 except on ratings of A-10 or higher.

Nickel

Mar. 30, 1942. Amendment to General Preference Order M-6-a broadens and extends allocations indefinitely. Includes solutions, concentrates, and residues from which metal is recoverable. Also salts, oxides, carbonates.

Rapeseed Oil

Mar. 25, 1942. General Preference Order M-77 issued, effective immediately, to conserve and direct supply of rapeseed oil. Provides that after April 1 rapeseed oil can be used only for manufacture of marine engine oils, heavy machine lubricating oils, pneumatic tool oils, blown rapeseed oil, and elastic solids for compounding rubber, unless specific authorization is given.

Order also limits use of oil during rest of March in manufacture of any other article to average monthly use during 1941.

Also contains requirement for setting up of 30% of all inventories in excess of 50,000 lbs., as a reserve. Oil will not be available in future for either edible uses or soap manufacture.

Refrigerant Gases

Mar. 3, 1942. Users of freon gas asked to ship empty cylinders to manufacturers to be refilled and used again for air conditioning.

Rhodium

Mar. 12, 1942. General Preference Order M-95 provides that rhodium may not be used from now on in jewelry. Jewelers authorized to use up present stocks.

Rubber

Mar. 2, 1942. Amendment No. 5 to Supplementary Order M-15-b substitutes four new lists of permitted products and uses.

Oxalic Acid

Revised Price Schedule No. 78

Issued Jan. 28, 1942; Effective Feb. 2, 1942

§ 1335.551 *Maximum prices for oxalic acid.* On and after February 2, 1942, regardless of the terms of any contract of sale or purchase, or other commitment, no person shall sell, offer to sell, deliver or transfer oxalic acid in containers of 100 pounds or more, and no person shall buy, offer to buy or accept delivery of oxalic acid in containers of 100 pounds or more at prices higher than the maximum prices set forth in Appendix A, incorporated herein as § 1335.559.

§ 1335.559 *Appendix A: Maximum prices for oxalic acid*—(a) *Delivered from producers' shipping points.* (1) The maximum prices for oxalic acid delivered from a producer's shipping point are established as follows:

	Carlot quantities	Less than carlot quantities (10,000 lbs. or more)	Less than carlot quantities (Less than 10,000 lbs.)
	($ per lb.)	*($ per lb.)*	*($ per lb.)*
Crystalline Oxalic Acid in barrels or other containers (more than 290 lbs.)	.11¼	.11½	.12½
Crystalline Oxalic Acid in kegs, drums, or other containers (100 lbs. to 290 lbs. inclusive)	.11¾	.12	.13
Powdered Oxalic Acid in barrels or other containers (more than 290 lbs.)	.12¼	.12½	.13½
Powdered Oxalic Acid in kegs, drums, or other containers (100 lbs. to 290 lbs. inclusive)	.12¾	.13	.14

(2) The above maximum prices are f. o. b. the producer's shipping point, with freight equalized at the rate for a shipment of identical quantity over standard routes from Producers' shipping points, viz.: Jersey City, N. J.; Niagara Falls, N. Y.; Buffalo, N. Y.; or Chicago Heights, Illinois. The maximum prices which a purchaser may pay for oxalic acid delivered to him from a producer's shipping point shall not exceed the maximum prices listed above plus the transportation charge on a shipment of identical quantity to destination from that producer's shipping point from which the transportation rate to destination is least.

(b) *Delivered from local stocks.* The maximum prices for oxalic acid delivered from local stocks maintained at points other than a producer's shipping point shall not exceed a price ex seller's warehouse equal to the maximum prices listed in subparagraph (1) of paragraph (a) above, plus the transportation charge on a shipment of identical quantity over standard routes to seller's warehouse from that producer's shipping point from which the transportation rate to seller's warehouse is least.

(c) *Export sales and sales to territories and possessions of the United States.* The following maximum prices are established for export sales of oxalic acid to persons in foreign countries and for sales to persons in the territories or possessions of the United States, where the shipments pursuant to such sales originate in the continental United States exclusive of Alaska:

(1) The maximum prices for shipments by vessel, f. a. s. vessel at the port of shipment, are the maximum prices listed in subparagraph (1) of paragraph (a) above, plus the transportation charges on a shipment of identical quantity over standard routes to alongside vessel at the port of shipment from that producer's shipping point from which the transportation charges to alongside vessel at the port of shipment are least, plus $.006 per pound.

(2) The maximum prices for overland shipments are the maximum prices established by paragraphs (a) and (b) above, plus $.004 per pound.

(3) No expenses, commissions, or charges for services may be added to the maximum prices established by subparagraph (1), (2), and (3) of this paragraph (d), except (i) ocean freight, (ii) marine and war risk insurance, (iii) in the case of overland shipments, transportation charges from seller's shipping point to destination permitted to be added by paragraphs (a) and (b) above, and (iv) foreign agent's commission unless the foreign agent's commission or any part thereof is received by the exporter directly or indirectly for his own use.

(d) *Containers.* No charge for containers may be added to the maximum prices established above.

War Regulations

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Mar. 13, 1942. Reclaimed rubber is still available for manufacture of rubber heels. A published report that WPB had banned production of rubber heels was not correct.

Mar. 18, 1942. Rubber companies agree to rescind price increases effected January 1, on tires sold as original equipment for automobiles and trucks.

Mar. 21, 1942. Amendment No. 6 to Supplementary Order M-15-b bans use of scrap, reclaimed rubber for specified list of products after March 31.

Mar. 28, 1942. Conservation Order M-124 prohibits sale, delivery or purchase of rubber yarn or elastic thread or processing of such in any way except for filling defense orders or as otherwise ordered by Director of Industry Operations.

Mar. 30, 1942. Amendment No. 7 to M-15-b reduces consumption of crude rubber or latex in certain products and eliminates entirely use in others.

Salicylic Acid

Revised Price Schedule No. 103

Issued Feb. 9, 1942; Effective Feb. 16, 1942

§ 1335.951 *Maximum prices for salicylic acid.* On and after February 16, 1942, regardless of the terms of any contract of sale or purchase, or other commitment, no person shall sell, deliver, or transfer salicylic acid in quantities of one pound or more, and no person shall buy, offer to buy, or accept delivery of salicylic acid in quantities of one pound or more at prices higher than the maximum prices set forth in Appendix A, incorporated herein as § 1335.959.

§ 1335.959 *Appendix A: Maximum prices for salicylic acid.* The following maximum prices are established for salicylic acid:

(a) *Sales by producers and primary jobbers.* (1) The maximum prices for sales of salicylic acid by producers or primary jobbers are established as follows:

Quantity	U.S.P. per pound	Technical, per pound
Carlot	$0.28	$0.26
100 pounds or more in barrels	.35	.33
50 pounds or more in 50-pound drums	.37	.35
100 pounds or more in 25-pound drums	.36	.34
50 to 100 pounds in 25-pound drums	.37	.35
25 to 50 pounds in 25-pound drums	.38	.36
5 pounds or more in 5-pound drums	.44	.42
1 pound or more in 1-pound cartons	.46	.44
50 pounds or more in 50-pound drums	.48	.46
100 pounds or more in 25-pound drums	.47	.44
50 to 100 pounds in 25-pound drums	.48	.46
25 to 50 pounds in 25-pound drums	.49	.47
5 pounds or more in 5-pound cartons	.57	.55
1 pound or more in 1-pound cartons	.60	.57

(2) The above maximum prices are f. o. b. the producer's or primary jobber's shipping point, with freight equalized at the rate for a shipment of identical quantity over standard routes from the following points, viz.: New York City, New York; Philadelphia, Pennsylvania; Chicago, Illinois; and St. Louis, Missouri. The maximum prices which a purchaser may pay for salicylic acid delivered to him from a producer's or primary jobber's shipping point shall not exceed the maximum prices listed above plus the transportation charge on a shipment of identical quantity to destination from that city named above from which the transportation rate to destination is least.

(b) *Sales by resellers.* The maximum prices for sales of salicylic acid are established as follows, f. o. b. reseller's shipping point.

Quantity	U.S.P. per pound	Technical, per pound
Carlot	$0.36	$0.34
100 pounds or more in barrels	.46	.43

(c) *Export sales and sales to persons in Territories and possessions of the United States.* The following maximum prices are established for export sales of salicylic acid to persons in foreign countries and for sale to persons in the territories or possessions of the United States, where the shipments pursuant to such sales originate in the continental United States exclusive of Alaska:

(1) *Exports and sales by producers and primary jobbers.* (i) The maximum prices, except for export sales to persons in Canada or Mexico, are the maximum prices listed in paragraph (a) of this Appendix, f. a. s. vessel at the port of shipment, plus 10 percent of the applicable maximum price.

(ii) The maximum prices for export sales to persons in Canada or Mexico are the maximum prices listed in paragraph (a) of this Appendix, f. o. b. shipping point in case of overland shipments, or f. a. s. vessel at the port of shipment in case of shipment by vessel, plus 5 percent.

(2) *Exports and sales by resellers.* (i) The maximum prices, except for export sales to persons in Canada or Mexico, are the maximum prices listed in paragraph (a) of this Appendix, f. a. s. vessel at the port of shipment, plus 40 percent of the applicable maximum price.

(ii) The maximum prices for export sales to persons in Canada or Mexico are the maximum prices listed in paragraph (b) of this Appendix, f. o. b. shipping point in case of overland shipments, or f. a. s. vessel at the port of shipment in case of shipment by vessel, plus 5 percent of the applicable maximum price.

(3) *Expenses.* No expenses, commissions, or charges for services may be added to the maximum prices established in this paragraph (c), except (i) ocean or overland freight, (ii) marine and war risk insurance, and (iii) foreign agents' commission, unless such foreign agents' commission or any part thereof is received by the exporter directly or indirectly for his own use.

(d) *Containers.* No charge for containers may be added to the maximum prices established by Price Schedule No. 103.

Shellac

Mar. 21, 1942. Shellac limitation order being prepared to curtail civilian consumption.

Solvents

Mar. 19, 1942. Producers and sales agents requested to maintain for benzol, toluol, xylol and solvent naphtha through second quarter of 1942 the prices prevailing during first quarter, 1942.

Tin

Mar. 9, 1942. WPB warns that scrap dealers violate Conservation Order M-43-a by offering solder for sale if they did not manufacture it during first quarter of 1940.

Mar. 18, 1942. Army, Navy and other Government agencies placed under terms of Conservation Order M-43-a by WPB. Order amended to list percentages of tin allowable in manufacture of various products.

Mar. 20, 1942. Amendment No. 1 to M-43-a provides that frozen stocks of white metals in jewelers shops be taken by Government.

Mar. 27, 1942. Amendment No. 1 to Price Schedule No. 17 allows premiums over maximum prices on export sales.

Titanium Pigments

Mar. 16, 1942. One producer permitted for short period to charge 1½ cents per lb. above maximum price set by Amendment No. 1 to Revised Price Schedule No. 98.

Tung Oil

Mar. 20, 1942. Amendment to General Preference Order M-57 permits manufacturer with oil on hand to sell stocks to other manufacturers.

Zinc

Mar. 13, 1942. Amendment No. 1 to Price Schedule No. 81 relating to toll agreements and specification zinc have been rewritten to end unnecessary hardship to parties concerned and which might have tended to interrupt flow of material essential to national defense.

Mar. 16, 1942. General Imports Order M-63 amended to remove restrictions on importations of cadmium, zinc ores and concentrates, lead ores and concentrates, and copper ores and concentrates. Seven other commodities were added to the list under control by the amendment.

Mar. 28, 1942. April zinc pool set at 60% of January, 1942 output for high and special grades; 40% for all other grades. No quota for zinc dust and zinc oxide.

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A Complete Check—List of Products, Chemicals, Process Industries

Cellulose

Production of thin films of cellulose esters. No. 2,272,662. Alfred Fischl.

Method forming variable denier cellulose derivative yarn. No. 2,272,666. Robert M. Hoffman to E. I. du Pont de Nemours & Co.

Process producing color effects on materials containing organic derivatives of cellulose. No. 2,273,305. William Whitehead to Celanese Corp. of America.

Agents for dressing and softening of regenerated cellulose products consisting of an aqueous impregnation-liquid containing 1.5% of glycerol-monomethylether and 1.5% of triacetine. No. 2,273,636. Walter Gellendien and Johann Eggert to "Patchem A. G. zur Beteiligung au Patenten und Sonstigen Erfindungsrechten auf Chemische Farfahren."

Ceramics, Refractories

Process for making refractory materials. No. 2,272,324. Harley C. Lee to Basic Refractories, Inc.

Method manufacturing dielectrically high-grade ceramic materials which comprises firing a ceramic mixture consisting mainly of crystalline titanium dioxide in contact with an oxygen-rich atmosphere substantially free of reducing agents. No. 2,272,330. Paul Schupp to "Fides" Gesellschaft fur die Verwaltung und Verwertung.

Method producing a dielectrically high-grade titanium dioxide of crystalline form which comprises subjecting crystallized titanium dioxide to a heat treatment at an elevated temperature promoting the perfection of the crystalline lattice and in an oxygen-rich atmosphere substantially free of reducing agents. No. 2,272,331. Paul Schupp to "Fides" Gesellschaft fur die Verwaltung und Verwertung.

Ceramic material in the form of a dense non-porous, sintered mass showing upon chemical analysis a content of approximately 85 to 99% aluminum oxide from .67 to 10% zirconium oxide and from .33 to 5% silicon dioxide said material being substantially free from zircon. No. 2,272,338. Albra H. Fessler and Karl Schwartzwalder to General Motors Corp.

Method making transparent article of silica which includes vaporizing a hydrolyzable compound of silicon into a high temperature flame of combustible gas combined with oxygen, impinging the flame on refractory core to deposit thereon a layer of silica in the shape of the desired article, and vitrifying the layer to a transparent article at temperature of from 1000°C. to 1400°C. No. 2,272,342. James F. Hyde to Corning Glass Works.

Ceramic product made by firing a ceramic mixture consisting of from .35 to 99% beryllium oxide from .50 to 96% aluminum oxide and from .50 to 30% silicon dioxide. No. 2,272,346. Taine G. McDougal, Karl Schwartzwalder and Albra H. Fessler to General Motors Corp.

Insulating body consisting of brucite with its natural impurities, said impurities being essentially CaO, Al_2O_3 and SiO_2 and together constituting about 5% of the body, and a mixture of beryl and titanium oxide constituting from 2% to 10% of the body, the beryl and titanium oxide in the mixture being in proportions not greater than 3 to 1 to 1 of the other. No. 2,272,480. Frank H. Riddle to Champion Spark Plug Co.

Ceramic body for spark plug insulator. No. 2,272,618. Albra H. Fessler and Karl Schwartzwalder to General Motors Corp.

In sealed combination a metal having substantially expansion characteristics of iron and a glass which contains about 45% SiO_2, about 12% K_2O, about 6% Na_2O, about 32% PbO and about 5% CaF_2. No. 2,272,747. Albert W. Hull and Louis Navias to General Electric Co.

Abrasive body bonded with resins for grinding wheel. No. 2,272,873-878. Samuel S. Kistler to Norton Company.

Method increasing chemical durability of an article of glassware, which comprises steps of introducing steam into said article and thereafter circulation a scavenging fluid through the article to remove steam and all residual moisture from the interior thereof. No. 2,273,778. Walter K. Berthold to Hartford-Empire Co.

Chemical Specialty

Method sterilizing purifying bathing water in swimming pools by use of chlorine and hydrogen peroxide. No. 2,272,223. Kurt Pietzsch to Buffalo Electro-Chemical Co.

Process for manufacture of white stiffened fabrics and fabric articles. No. 2,272,294. Donald Finlayson to Celanese Corp. of America.

Method making shoe filler compositions which comprises steps of heating pine oil foots to expel volatile matter therefrom, swelling unmilled rubber to gelatinous condition with volatile liquid hydrocarbon solvent, and mixing resulting materials with comminuted body material as a binder. No. 2,272,482. Ernest D. Sackett to North American Holding Corp.

Core oil, comprising marine oil fatty acid composition containing at least 40% C_{22} fatty acid radicals in concentration substantially greater than in normal fatty acid mixture of hydrolyzed marine oil. No. 2,272,483. Madison L. Sheely to Armour & Co.

Moisture-reactivatable adhesive composition especially adapted for gummed tape or the like and capable of being adhesively activated practically instantaneously upon being moistened or wetted with water. No. 2,272,516. Earle R. Edson to LePage's, Inc.

Embalming compositions characterized by presence of small amount of alkylated benzylammonium salt. No. 2,272,525. Hilton I. Jones.

Flour bleaching composition comprising dry free flowing powdered mixture of an active organic peroxide having substantial flour bleaching properties and an alkalinous metal water soluble compound containing, per mole, about two to about 12 moles of water of crystallization, in sufficient amount to prevent flammability of the organic peroxide, and an anhydrous packing inhibitor. No. 2,272,576. Frederic H. Penn.

Flour bleaching composition comprising dry free flowing powdered mixture of an active organic peroxide having substantial flour bleaching properties, a water soluble alkali metal salt containing, per mole, about 2 to about 10 moles of water of crystallization, in sufficient amount to prevent flammability of the organic peroxide and an anhydrous packing inhibitor. No. 2,272,577. Frederic H. Penn.

Process improving storage and keeping qualities of butter, hydrogenating dehydrated butter fat in substantial absence of air and moisture at a temperature of from about 35°C. to about 60°C., and emulsifying the hydrogenated product with water. No. 2,272,578. Frederic H. Penn.

Method pretreating cereals. No. 2,272,663. Hermann Graumann to Wessanen's Koninklijke Fabrieken N. V.

Printing powder comprising resin which is compatible with ethyl cellulose, ethyl cellulose, a methyl ester of abietic acid, calcium carbonate and coloring matter. No. 2,272,706. A. De Vere Harnett.

Sponge of genus "Spongia" having bactericidal and sterilizing properties and containing a practically water insoluble silver albumin compound finely distributed and firmly held within its capillary fibrous structure. No. 2,272,728. Sam Rosenzweig.

Process removing the skins of nut meats, which comprises immersing the meats with the skins thereon in a solution of approximately 3% of one of the alkalis of the group consisting of sodium hydroxide, sodium carbonate, sodium bicarbonate and borax for a period of from one to four minutes, removing the nut meats and rinsing the same in water, immersing the nut meats in a bath of about 2% to 4% solution of an acid of the group consisting of hydrochloric, acetic and citric acids for a period of from one to four minutes, removing the nut meats from the last mentioned bath, and then subjecting the material to a forcible action of water to remove the skins. No. 2,273,183. Edward Edes.

Chewing gum material comprising ethyl cellulose and a gum selected from the group consisting of resins, rubbers and chicle. No. 2,273,425. Waldorf S. Traylor to Hercules Powder Co.

Method coloring rubber hydrochloride cement with insoluble coloring matter which comprises milling the coloring matter into material of class consisting of rubber, gutta percha, balata, and condensation derivatives of rubber, which material is compatible with rubber hydrochloride and dispersing the colored material and the rubber hydrochloride in a solvent for same. No. 2,273,473. James A. Merrill to Wingfoot Corp.

Pest-control composition containing as an essential active ingredient a cyclic ammionmethyl sulfide. No. 2,273,664. Norman E. Searle to E. I. du Pont de Nemours & Co.

Fungicidal composition containing a yellow cuprous oxide substantially all of the particles of which are less than four microns in diameter characterized by its color, its fine state of subdivision, its high copper content and the presence of a small amount of a lyophilic protein colloid within and surrounding the particles thereof. No. 2,273,708. Loren C. Hurd to Rohm & Haas Co.

Coal Tar Chemicals

Method making sulfur-containing organic condensation products. No. 2,272,265. Walter Frost, Otto Kolbl, and Gehard Kallner to Silesia, Verein Chemischer Fabriken.

Alkali metal salts of dihydroxy hexachloro diphenyl methane. No. 2,272,268. William S. Gump to Burton T. Bush, Inc.

Process for preparing hydroxy naphthalene compounds. No. 2,272,272. Harold G. Mow to Allied Chemical & Dye Corp.

Compounds of the diaryl series. Process for process for producing. No. 2,272,498. Werner Zerweck, Karl Schutz and Heinrich Ritter to General Aniline & Film Corp.

Furane derivatives of pyrazolone series and method making same. No. 2,272,739. Max Dohrn and Kurt Hamann to Schering Corp.

Saturated and unsaturated pregnane-21-als containing in 20-position a member of the group consisting of an esterified and an etherified hydroxyl group. No. 2,272,809. Karl Miescher and Albert Wettstein to Ciba Pharmaceutical Prods., Inc.

Producing corrosion retarding coatings on articles of copper and its alloys which comprises subjecting surface thereof to action of a solution containing an acid phosphate selected from group consisting of zinc, manganese, cadmium and magnesium and an oxidizing agent selected from the group consisting of persulfates, permanganates, lodates, nitrites and peroxides. No. 2,272,216. Herman J. Lodeesen to Parker Rust Proof Co.

Coating for fibrous glass strands. No. 2,272,588. Allen L. Simison to Owens-Corning Fiberglas Corp.

Process producing adherent coatings of cadmium to be deposited on metal of group consisting of copper, brass, iron, copperplated iron, and brass plated iron, without the application of an outside source of electric current, by means of a hot bath treatment in which the articles to be coated are treated in hot aqueous alkali cadmium salt solutions which contain an excess of free caustic alkali many times by weight that of the dissolved cadmium metal. No. 2,272,777. Georg Reuter.

An alkyl mercury naphthosulfamic acid. No. 2,273,443. Heinrich Klos to Winthrop Chemical Co., Inc.

Process producing sulfamides of ortho-dicarboxylic acid amides. No. 2,273,444. Karl Koeberle, Willy Braun and Fritz Hanusch to General Aniline & Film Corp.

Aromatic esters and manufacture thereof. No. 2,273,556. Frederic R. Bean to Eastman Kodak Co.

Substituted aromatic aliphatic ether chlorides and process. No. 2,273,622. Herman A. Bruson to Rohm & Haas Co.

Mixed unsymmetrical ketones and a process for producing them. No. 2,273,676. Reginald L. Wakeman to Allied Chemical & Dye Corp.

Diacylamino-1, 3, 5-triazines. No. 2,273,687. Louis H. Bock and Alva L. Houck to The Resinous Products & Chemicals Co.

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Coatings

In coating iron and steel articles, process which comprises exposing surface of such an article to action of aqueous solution containing substantial amount of ferric oxalate until coating of substantial thickness forms. No. 2,273,234. Robert R. Tanner to Parker Rustproof Co.

Dyes, Stains

Process for manufacture of water or acid soluble agents for improving the fastness of directly dyed cellulose fibers to water, acid boil and wet ironings, comprising condensing an aldehyde selected from the group consisting of formaldehyde and acetaldehyde with a polyethylene polyamine and a saturated open-chain aliphatic ketone. No. 2,272,783. Jules Treboux to J. R. Geigy A. G.

Salts of basic complex chromium-compounds of mordant dyestuffs of the triarylmethane class with hydrochloric acid, being coloured products soluble in excess of 10% in lower alcohols. No. 2,272,-791. Achille Conzetti and Otto Schmid to J. R. Geigy S. A.

Disazo dyestuffs soluble in water. No. 2,273,094. Erich Fischer and Richard Huss to General Aniline & Film Corp.

Process of producing fast dyeings on fibrous material of the group consisting of cellulose fibers, animal fibers and mixtures of animal fibers with cellulose fibers which comprises applying to the fiber a compound derived from 1.35-triazine containing an azo group, a group conferring solubility in water, a diazotizable amino group and a grouping which is capable of coupling with a diazo compound, then diazotizing the compound on the fiber and causing self-coupling by an alkaline treatment. No. 2,273,115. Herbert Kracker Willy Schumacher and Vinzenz Schwind and Wilhelm Seidenfaden to General Aniline & Film Corp.

Azo dyestuffs insoluble in water and fiber dyed therewith. No. 2.273,116. Georg Kranzlein and Carl Muller to General Aniline & Film Corp.

Process of producing fast dyeings and the dyed fiber obtained thereby. No. 2,273,117. Georg Kranzlein. Werner Kirst, Konrad Renn and Wilhelm Seidenfaden to General Aniline & Film Corp.

Azo dyestuffs soluble in water. No. 2,273,517. Erich Fischer to General Aniline & Film Corp.

Equipment, Apparatus

Centrifugal filter comprising a rotatable shaft a head secured to and rotatable with said shaft a second head spaced from said first head and mounted on said shaft for rotation therewith and adjustable axially thereon a filter medium comprising a perforate elastic sheet material secured to said heads and enclosing the space between said heads, and means for moving the adjustable head relative to the first head to stretch the elastic sheet and to enlarge the perforations therein. No. 2,272,175. Hubert F. Jordan to United States Rubber Co.

Fractionation. No. 2,272,261. Donald J. Bergman to Universal Oil Products Co.

Device for generating and accelerating a beam of ions. No. 2,272,374. Hartmut I. Kallmann and Ernst Kuhn to I. G. Farbenindustrie Aktiengesellschaft.

Method showing representation of distribution of intensity of a beam of slow neutrons. No. 2,272,375. Hartmut I. Kallmann and Ernst Kuhn to I. G. Farbenindustrie Aktiengesellschaft.

Filtering apparatus. No. 2,272,583. Jesse O. Reed to Henry A. Wallace.

Copper coated cooking vessel. No. 2,272,609. James M. Kennedy, Arthur P. Knight and Harold J. Lee to Revere Copper Brass, Inc.

Device for freezing liquid material. No. 2,272,715. Ernest E. Lindsey.

Acetylene generator adapted to utilize run-of-crusher carbide comprising a tank adapted to contain water; a carbide hopper; a carbide feed chute for delivering the large lumps of carbide from said hopper to a point below the level of the water within said tank, and for confining a portion of the water in said tank separately from the remainder thereof, said chute also constituting means for retaining the carbide fines within such confined portion of water; and a common chamber for collecting the acetylene generated by all of the carbide. No. 2,272,979. James Marshall and Chester Siver to The Prest-O-Lite Co., Inc.

Liquid weighing and dispensing apparatus. No. 2,273,180. Manuel de Castro.

In melt spinning apparatus, a reaction vessel for synthesizing a linear superpolymer at a temperature above the melting point thereof. No. 2,273,188. George Graves to E. I. du Pont de Nemours & Co.

Method vaporizing liquefied gases having boiling point at atmospheric temperature below 0° C. which consists in supplying said liquid to heat exchanger and maintaining an intermediate heat transferring layer of vaporized liquid between surface of cold liquid passage and surface exposed to steam. No. 2,273,257. Karl A. Gardner to The Griscom-Russell Co.

Apparatus for treating oils. No. 2,273,482. Sumner E. Campbell.

Solvent extraction process and apparatus. No. 2,273,557. Michele Bonotto to Extractol Process Ltd.

Electrolytic cell. No. 2,273,795. George W. Heise and Erwin A. Schumacher to National Carbon Co.

Chemical dehumidifying system. No. 2,273,804. Alwin B. Newton to Minneapolis-Honeywell Regular Company.

Method hardening inner periphery of a tubular ferrous chamber. No. 2,273,809. Augustus B. Kinzel to Union Carbide & Carbon Corp.

Explosives

Explosive device comprising a unit including a central chamber containing a shattering charge, a radially concentric chamber containing a liquefied gas, another radially concentric chamber adjacent thereto and connecting therewith to permit of evaporation of said liquefied gas, another radially concentric chamber containing a liquefied gas capable of explosive combination with said first mentioned liquefied gas when intermingled therewith, and heat insulating means protecting said unit. No. 2,273,166. Robert Allen.

Fine Chemicals

Method producing color-forming photographic layer comprising mixing, in an organic solvent for both, a synthetic resin selected from group consisting of polyvinyl acetal, polyvinyl acetate, reduced coumarone indene and polystyrene, with a coloring material and dispersing the mixture of synthetic resin and coloring material in a gelatino silver halide emulsion. No. 2,272,191. Scheuring S. Fierke to Eastman Kodak Co.

Synthesis of vitamin B_6. No. 2,272,198. Stanton A. Harris to Merck & Co., Inc.

Alkaline earth metal salts of dihydroxy hexachloro diphenyl methane. No. 2,272,267. William S. Gump to Burton T. Bush, Inc.

Process for preparation of 2 to 4 carbon atoms sugars comprising step of condensing formaldehyde in non-alkaline substance anhydrous solution in an inert solvent therefor while in contact with a condensation catalyst selected from group consisting of oxides, hydroxides, carbonates and organic salts of the metals, lead, magnesium, zinc and alkaline earth metals, whereby sugars of 2 to 4 carbon atoms are formed. No. 2,272,378. Eugene J. Lorand to Hercules Powder Co.

Method coloring metallic photographic image. No. 2,272,556. Alan M. Gundelfinger to Cinecolor, Inc.

Method coloring a photographic silver image. No. 2,272,557. Alan M. Gundelfinger and Lyne S. Trimble to Cinecolor, Inc.

Preparation of protein material which consists of treating soybean meal with from .1 to 1. normal aqueous sulfurous acid, separating resulting protein solution from insoluble residue, precipitating protein material in solution by adding a neutralizing agent in quantity sufficient to bring liquid to isoelectric point of protein, and separating precipitated protein. No. 2,272,562. Hiromu Iwamae.

Preparation of protein material which consists treating soybean meal with from .1 to 1.N aqueous sulfurous acid, separating resulting solution from insoluble residue, and expelling sulfur dioxide from solution thereby precipitating protein product. No. 2,272,563. Hiromu Iwamae.

Substance selected from the group consisting of the alkaloid erythratine, obtainable from certain botanically related species of Erythrina, the hemihydrate of said alkaloid having a melting point of about 170-170.5° C., and $[a]_{25D} = +145.5°$ (absolute alcohol), and hydrohalides of said alkaloid. No. 2,273,031. Karl Folkers and Frank Koniuszy to Merck & Co., Inc.

Process preparing the cardiac substance uscharidin which comprises obtaining the glucoside uscharin from the milky juice of Calotropis species, splitting said uscharin by treating it with an acidic splitting agent, and isolating uscharidin from the mother liquors. No. 2,273,196. Gerhard Hesse to C. H. Boehringer Sohn.

Sensitive silver halide photographic emulsion stabilized by presence therein of a pyrimidine compound containing at least two like polar substituents selected from group consisting of amino and hydroxyl groups. No. 2,273,562. Edward P. Davey and Edward B. Knott to Eastman Kodak Co.

Water-soluble complex gold-peptone-saccharide compounds and their manufacture. No. 2,273,765. Alois Schwarzmann.

Industrial Chemicals

Recovering high boiling plasticizer from photographic film scrap which comprises leaching the scrap with a water-miscible solvent for plasticizer, which solvent is more volatile than water and will not dissolve the principal portion of film base, continuously introducing spent leaching liquid containing plasticizer and water into a distilling column, applying heat thereto, refluxing withdrawing the mixture of plasticizer and water which collects at bottom of column and separating plasticizer from water. No. 2,272,193. Webster E. Fisher and Albert G. Bright to Eastman Kodak Co.

Process for thermaldehydration of lower fatty acids, which comprises subjecting vapor of acid to a temperature of from 500 to 1000°C. in the presence of phosphoric acid and copper oxide. No. 2,272,-293. Henry Dreyfus to Celanese Corp. of America.

Process of dehydrating sodium sulfate decahydrate comprises forming saturated solution of sodium sulfate, heating and maintaining said saturated solution at temperature above 32.4°C. by passing alternating current between electrodes placed in touch with the saturated solution below surface thereof thus to cause said saturated solution to become heated by reason of its resistance cooling at least one of said electrodes to a temperature below that of saturated solution and feeding sodium sulfate decahydrate into said saturated solution. No. 2,272,345. Kenneth A. Kobe.

Casein-cold-process. No. 2,272,352. Kurt Ripper to American Cyanamid Co.

New terpene compound having type formula $R(OOCR'Zw)y$ in which R is a radical of a terpene polyhydric alcohol, in which R' is a hydrocarbon radical, in which Z is a negative group, and in which w and y are small whole numbers. Also terpin di(thiocyanoacylate). No. 2,272,400. Joseph N. Borglin to Hercules Powder Co.

Process producing pure phosphoric acid of strength within range of 104.9% to 116% equivalent H_3PO_4 content. No. 2,272,402. Gaston Du Bois to Monsanto Chemical Co.

Method producing acids of phosphorus. No. 2,272,414. Campbell Rogers McCullough to Monsanto Chemical Co.

Wax-like condensation product from a cyclic dicarboxylic acid from which an anhydride can be formed only by combination of two molecules of acid, an aliphatic carboxylic acid selected from the class consisting of aliphatic mono-and dicarboxylic acids, and a mixture of an aliphatic amine having at least one alkyl radical containing at least 8 carbon atoms and an aliphtic polyamine each of the said amines containing at least one hydrogen atom attached to nitrogen. No. 2,272,466. Hans G. Hummel and Michael Jahrstorfer to General Aniline & Film Corp.

Alkyl esters of fatty acids of non-drying vegetable oils organically combined with bromine and chlorine, the amount of combined chlorine not exceeding 10% of amount of combined bromine. No. 2,272,-484. Robert S. Shelton to Wm. S. Merell Co.

Zein. Process for production. No. 2,272,488. Lloyd C. Swallen to Corn Products Refining Co.

Nitrogenous condensation products from non-crystalline product obtained by polymerization of an ethylene imine and an aliphatic halide containing at least 16 carbon atoms in the hydrocarbon chain. No. 2,272,489. Heinrich Ulrich to General Aniline & Film Corp.

Phosphatidic compound resulting from reaction between an alkali metal salt of an inorganic acid and a phosphatide. No. 2,272,616. Benjamin H. Thurman to Refining, Inc.

Particles of substantially pure anhydrous monocalcium phosphate individually coated with calcium acid pyrophosphate, the coating being free from phosphoric acid and free from ortho- and metaphosphates, and from alkali metals, the coating consisting of calcium acid pyrophosphate constituting about 10% to 25% of entire

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particle. No. 2,272,617. Edwin Cox, Robert H. Kean, Frank B. Carpenter, Jr. and Wilbur K. Enos to Virginia-Carolina Chemical Corp.

Process producing p-cymene which comprises passing vapors of monocyclic terpene at dehydrogenation temperatures over a catalyst containing palladium supported on a carrier having high surface activity. No. 2,272,711. Washington Hull to American Cyanamid Co.

Method converting phosphate rock to a citrate soluble form. No. 2,272,799. Johnson Hagood to Southern Phosphate Corp.

In process making asphalt, heating and agitating residuum in exposure to oxygen, to partial conversion to desired specifications, then without further supplying oxygen incorporating in the residuum a small amount of zirconium halide and a small amount of a hydrohalogen acid. No. 2,272,866. Robert Burk and Charles Whitacre to Standard Oil Co., Cleveland, Ohio.

Selective solvent extraction process. No. 2,272,951. Rudolf Morf and Gerard Cornaz.

Process refining oils and fats containing photosensitizing pigments to check the development of rancidity comprising percolating the oil or fat through a column of finely powdered sugar, whereby said pigments are absorbed in the sugar and removed from the oil or fat, and thence recovering the oil or fat product free of said pigments. No. 2,272,964. Mayne Coe and Mayne Coe, Jr. to free use of the People of the U. S. A.

Process for increasing fermentative efficiency in ethanol production. No. 2,272,982. William Owen.

Process which comprises heating an aromatic amine of the group consisting of aniline and its homologues at temperatures of at least 200° C. under superatmospheric pressure in the presence of water and of an acid catalyst known to promote hydration. No. 2,273,-030. Wilhelm Fitzky and Herbert Kracker to General Aniline & Film Corp.

Polymerization of gases. No. 2,273,038. Eugene Houdry and James Daugherty, Jr. to Houdry Process Corp.

In process for increasing the hydrophobic properties of a surface, the step comprising effecting contact of the surface with an aqueous solution of a complex compound of the Werne type in which a trivalent nuclear chromium atom is coordinated with an acyclic carboxylic acido group havin at least ten carbon atoms. No. 2,273,-040. Ralph Iler to E. I. du Pont de Nemours & Co.

Process recovering sterols which comprises extracting substantially dry, substantially oil-free soybean material containing sterols and a basic substance with a water miscible volatile ketone, separating the extract from the insoluble residue and concentrating the extract by evaporating the ketone in the presence of a basic substance. No. 2,273,045. Percy Julian and John Cole to The Glidden Co.

In process recovering sterols the steps comprising treating a concentrate containing sterols and impurities selected from the class consisting of other unsaponifiable organic matter, oil, phosphatides, soap and pigment impurities with heated glacial acetic acid to dissolve the sterols and the impurities, and cooling the solution to crystallize the sterols from the solution. No. 2,273,046. Percy Julian and John Cole to The Glidden Co.

Production of amines of the acetylene series. No. 2,273,141. Walter Reppe and Otto Hecht to General Aniline & Film Corp.

In process for the manufacture of magnesium hydroxide from brines containing convertible magnesium salts the steps of deaerating the brine while the brine is at a temperature of the order of from 18 to 22° C., and then contacting the deaerated brine with a hydroxide capable of precipitating magnesium oxide. No. 2,273,178. Neil Collins to Marine Magnesium Prods. Corp.

Method of treating blast furnace gases and the like which comprises rough-cleaning the gas by contact with a high velocity confluent stream of water, collecting the wash water from said rough-cleaning operation, sharply altering the direction of flow of the gas, further cleaning the gas by contact with an extended surface stream of water flowing counter-current to the flow of the gas, and finally cleaning the gases by subjecting the presence of an extended surface stream of water, collecting together the water from said second cleaning and said electrical cleaning and separately collecting the water from said rough-cleaning operation. No. 2,273,194. Carl Hedberg and Joseph Phyl to Research Corp.

Process treating sugar beet juice comprising calcining lime-cake in direct-fired furnace to produce calcium oxide together with gases containing carbon dioxide in concentration less than 30% slaking said calcium oxide to produce compound suitable for defecating said beet juice, introducing said compound into said beet juice and corbonating said beet juice by introducing said gases into said beet juice. No. 2,273,253. Robert M. Daniels to Holly Sugar Corp.

Composition of matter comprising polymeric vinylidene chloride product and ester of aconitic acid at least in stabilizing quantities. No. 2,273,262. Alden W. Hanson and William C. Goggin to The Dow Chemical Co.

In process for preparation of oxygenated organic compounds the step which comprises reacting a methylene glycol di-ether with carbon monoxide. No. 2,273,269. Robert Johnson to E. I. du Pont de Nemours & Co.

Regenerated sulfur absorbing mass for use in desulfurizing of hydrocarbon vapors at temperature above about 700° F. in presence of hydrogen. No. 2,273,297. Antoni Szayna to Albert C. Travis.

Preparation of 2-mercapto-thiazolines. No. 2,273,424. Bernard M. Sturgis and John J. Verbanc to E. I. du Pont de Nemours & Co.

In method for purifying acetic acid from a natural source, the step of heating acid with minor proportions of nitric acid and sulfuric acid and thereafter separating acetic acid from resultant mixture. No. 2,273,459. Edgar C. Britton, Ralph P. Perkins and Andrew J. Dietzler to The Dow Chemical Co.

Method for simultaneous production of calcium metaphosphate and hydrogen, which comprises passing upward through a bed of phosphate rock a mixture of steam and phosphorus vapor in which the ratio of steam to phosphorus is greater than 10 to 1 by volume the while maintaining temperature of at least 900° C. and at substantially atmospheric pressure; thereby obtaining as products substantially pure calcium metaphosphate free of phosphite and hydrogen. No. 2,273,461. Stephen Brunauer and John F. Shultz to Henry A. Wallace.

Ethylated di-osopropyl halobenzene. No. 2,273,467. Robert R. Dreisbach to The Dow Chemical Co.

Di (arylalkyl) sulfide. No. 2,273,471. Richard H. Kimball to Hooker Electrochemical Co.

Process converting water-insoluble pectin into water-soluble pectin, which comprises treating a vegetable material containing water-insoluble pectin with a liquid consisting of an organic acid in which the substances accompanying the pectin are soluble but in which pectin itself is practically insoluble, and separating the resulting solution from the residue containing the water-soluble pectin. No. 2,273,521. Paul Hirsch to California Fruit Growers Exchange.

Method treating pectinous material which comprises contacting pectinous material with an acidic reagent incapable of dissolving the pectin to any appreciable extent, the reagent being adapted to materially alter the intrinsic setting time of the pectin to be extracted therefrom the pectinous material being maintained in contact with reagent for a period of time and at a temperature insufficient to destroy the gelatin characteristics of the pectin to be extracted but sufficient to materially alter the intrinsic wetting time thereof. No. 2,273,527. Glenn H. Joseph to California Fruit Growers Exchange.

Diamino benzyl alcohols and process for making. No. 2,273,564. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Process for treating alcohol and catalyst therefor. No. 2,273,573. Rudolph Leonard Hasche to Eastman Kodak Co.

Process removing calcium from gelatin, comprising passing an aqueous solution of gelatin over a zeolite selected from group consisting of base-exchanging alkali metal and ammonium zeolites steaming the resulting calcium zeolite and then converting steamed calcium zeolite to a zeolite selected from group consisting of base-exchanging alkali metal and ammonium zeolites. No. 2,273,577. Edwin E. Jelley to Eastman Kodak Co.

Process for production of aliphatic dinitriles of at least 3 carbon atoms which comprises passing a rapid current of ammonia through a liquid dicarboxylic compound containing at least 3 carbon atoms and adapted to form an ammoniated carboxylic compound with ammonia, the reaction being carried out at a temperature of from 150 to 350° C. in presence of a catalyst soluble in reaction material and selected from the group consisting of phosphoric acids and neutral and acid esters of phosphoric acids. No. 2,273,633. Maurice L. A. Fluchaire and Serge Lavorsky to Societe "Rhone-Poulene."

Process preparing dry, stable yellow cuprous oxide which comprises anodically oxidizing copper in hot alkaline solution containing at least 4% of an alkali halide and small amount of lyophilic protein colloid, adding additional amounts of colloid at rate commensurate with electrolytic action, washing precipitated copper compound with solution of a lyophilic protein-containing colloid, and drying said compound. No. 2,273,643. Loren C. Hurd to Rohm & Haas Co.

Composition of matter comprising 20 to 80 parts of hydrogenated castor oil dissolved in 80 to 20 parts of melted chlorinated naphthalene, to which is added meta-dinitrobenzene in proportion of less than 10% and including not more than 10% benzoic acid. No. 2,273,650. Charles E. Linebarger, Jr. to the Chaslyn Co.

In method producing highly pure magnesium oxide from metallic magnesium and water, steps which comprise adding water to a body of molten magnesium in an enclosed space in the absence of air and at substantially atmospheric pressure controlling the rate of addition of the water so that the temperature of the reaction does not exceed about 800° C. stopping the additions of water when the evolution of hydrogen substantially ceases and thereafter heating the reaction mixture above about 650° C. No. 2,273,707. Sheldon B. Heath and Alvin D. Dahl to The Dow Chemical Co.

Improvement in process dehydrating an aqueous solution of an alkali metal hydroxide at a pressure below 16 inches of mercury to insure precipitation of granules of alkali metal hydroxide during dehydration which comprises preventing substantial corrosion of the dehydrating equipment by the hydroxide and contamination of the hydroxide by mixing a non-reactive liquid coating agent which is substantially non-volatile at the temperature of dehydration with the aqueous hydroxide and dehydrating said hydroxide, the concentration of said agent in mixture being of sufficient magnitude to cause formation of a corrosion resistant film upon the walls of the evaporator and upon precipitated granules of the hydroxide. No. 2,273,722. Irving E. Muskat and Dwight R. Means to Pittsburgh Plate Glass Co.

Method recovering chlorine from a gaseous mixture which is derived from a process which results in the formation of a gaseous mixture containing chlorine and a substantial amount of other gaseous constituents which are normally insoluble in water. No. 2,273,723. Irving E. Muskat to Pittsburgh Plate Glass Co.

As new article of manufacture a tar comprising a blend of residue of destructive distillation of a pine wood resin which contains at least about 15% of gasoline-insoluble resinous material and a resin oil miscible therewith. No. 2,273,725. Philip A. Ray to Hercules Powder Co.

Process preparing monoperphthalic acid which comprises reacting phthalic anhydride and a solution of hydrogen peroxide having a concentration within the range 90-140 volumes, said reacting being carried out at a temperature not exceeding 73°C. No. 2,273,774. Joseph S. Reichert and Arthur A. Elston to E. I. du Pont de Nemours & Co.

Wax acrylate ester blends. No. 2,273,780. Harry R. Dittmar to E. I. du Pont de Nemours & Co.

Fluid medium for transmitting energy comprising water and from 20 to 50% by weight of a water soluble phosphate mixture comprising potassium monoethyl phosphate and potassium diethyl phosphate, said mixture being dissolved in said water in sufficient amounts to depress substantially the freezing point of water and said medium having a pH between about 7 and 8.5. No. 2,273,781. Carroll A. Hochwalt to Monsanto Chemical Co.

In liquid phase process for the preparation of aliphatic organic acids the step which comprises heating in the liquid phase an aliphatic ketone and water with carbon monoxide at a temperature below 350°C. No. 2,273,785. Alfred T. Larson to E. I. du Pont de Nemours & Co.

Process which comprises reacting an organic ester of an organic acid, which forms a stable acid when the alkoxy group of the ester has been replaced by a hydroxyl group with an aldehyde and water, and thereby obtaining the corresponding acid and acetal. No. 2,273,786. Donald J. Loder to E. I. du Pont de Nemours & Co.

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Method of electrolytic preparation of nitrogen compound. No. 2,273,796. George W. Heise and Erwin A. Schumacher to National Carbon Co., Inc.

Process electrolyzing brine. No. 2,273,797. George W. Heise and Erwin A. Schumacher to National Carbon Co., Inc.

Method oxidizing a salt selected from the group consisting of ferrous salts and salts of manganese in a valence state less than 7. No. 2,273,798. George W. Heise and Erwin A. Schumacher to National Carbon Co., Inc.

Method of reducing water-soluble inorganic salt of an element of variable valency in a high valency state to a salt of such element in a lower valency state. No. 2,273,799. Milton Janes and George W. Heise to National Carbon Co., Inc.

Leather

Process for finishing of leather, that is, treatment subsequent to tanning, which consists in contracting the fibres of the leather by applying heat at a temperature of 240°F.-600°F. to the tanned skin by pressing the skin against a hot surface under an applied pressure which does not exceed 301 bd. per sq. inch, and maintaining said skin free from tension along lines lying in the plane of the skin during the application of the heat and pressure. No. 2,272,935. Arthur Cotton.

Metals, Alloys

Reissue. **Steel containing tellurium.** No. 22,021. Morgan J. R. Morris to Republic Steel Corp.

Method forming cast articles such as storage battery grids from molten alloy of lead with calcium which comprises maintaining an atmosphere of carbon dioxide over molten alloy in kettle around the pouring spout or ladle and in cavities of mold during the filling thereof. No. 2,272,181. George M. Bouton and Earle E. Schumacher to Bell Telephone Labs., Inc.

Process manufacturing steel of improved machinability comprising adding to a molten mass of steel a sodium sulfite. No. 2,272,277. Edwin L. Ramsey and Leslie G. Graper.

Aluminum alloys. No. 2,272,390 to 2,272,393. Edmund A. Anderson & Gerald Edmunds, to The New Jersey Zinc Corp.

Ferrous alloy having analysis including between .20 and 2.00% carbon about 5.00 to about 30.00% chromium, 5.00 to about 15.00% copper, 1.00 to about 10.00% cobalg, .10 to about 3.00% molybdenum and the remainder substantially all iron said alloy being capable of being cast, and being characterized by wear-resistance and freedom from hot metal scale pick-up. No. 2,272,534. Jacob Trantin, Jr.

Corrosion-resistant alloy having a Brinell hardness of about 100 or higher consisting essentially of about 10 to 15% aluminum, about 7 to 10% manganese, about 2 to 3% silver as a homogenizer during cooling, about 0.5 to 1% of a metal of the group consisting of beryllium, iridium and tantalum, and substantially all of the balance being magnesium, said alloy being substantially free of silicon, stibium, nickel, chromium, molybdenum and titanium. No. 2,272,936. Alfred Dallenbach to Arnold Hammer.

Electrodeposition of metals. No. 2,273,036. George Heise and Erwin Schumacher to National Carbon Co., Inc.

Aluminum base alloy containing 0.5% to 12% copper, 0.5% to 5% nickel, 0.2% to 2.5% silicon, 0.1% to 3% magnesium, 0.2% to 2% iron, 0.05% to 1% columbium, remainder aluminum; the columbium acting to produce in the alloy a fine grained structure which is maintained over a wide range of melting, casting, and working conditions, and to raise the ratio of the ductility of the alloy to its tensile strength without decreasing the tensile strength. No. 2,273,061. Alfred Murphy, Petts Wood, and Stanley Wells to Electro Metallurgical Co.

Method producing beryllium-containing metallurgical concentrates for the production of alloys which comprises treating beryl to convert the beryllium and aluminum contents to the corresponding carbides, substantially free from silica, adding to the carbide mass a compound of a metal desired in the ultimate alloy; digesting the mass under heat and pressure with a mineral acid, recovering from the digest the beryllium content, together with the said metal value and utilizing the beryllium and such metal values for the production of an alloy. No. 2,273,168. Harry Armstrong.

Process for recovery of silver. No. 2,273,569. August Goette to Chemical Marketing Co., Inc.

Method reducing shrinkage of porous alloy articles during sintering. No. 2,273,589. Richard G. Olt to General Motors Corp.

Method decorating or resurfacing stainless steel tin or chromium surfaces which consists in placing a mask having openings therein upon the surface to be decorated, applying a solution containing mercury salts to the portion of the surface exposed through said openings for only a few seconds, rinsing the solution from the surface and removing mask. No. 2,273,665. Arthur D. Small to Otto G. Krayer.

Stainless steel containing bismuth. No. 2,273,731. Robert S. Peoples and Henry A. Holden to Alloy Casting Institute.

Platinum alloy comprising small but effective amount up to about 5% of tin and balance substantially all platinum. No. 2,273,805. Edmund M. Wise and Raymond F. Vines to The International Nickel Co.

Platinum base alloy comprising about 0.35% to about 5% tin, about 0.5% to about 15% of at least one metal of group consisting of ruthenium iridium palladium, osmium and rhodium and the balance substantially all platinum. No. 2,273,806. Edmund M. Wise and Raymond F. Vines to The International Nickel Co., Inc.

Paints, Pigments

Method producing metallic pigments in dry powder form having high covering power, steps comprising subjecting a sludge of metallic powder and volatile liquid to temperature sufficient to vaporize and drive off volatile portion of sludge, while simultaneously subjecting sludge and dry metallic powder thus produced to action of impact bodies to substantially eliminate agglomerates and burnish dry metallic powder. No. 2,272,629. Furman C. Arthur to Aluminum Co. of America.

Iron oxide pigments and process of producing the same. No. 2,273,101. Ulrich Haberland to General Aniline & Film Corp.

Process producing rutile titanium dioxide comprising subjecting anatase titanium dioxide to initial calcination at temperatures ranging from about 800 to 1100° C. in presence of small amount of potassium sulfate, treating resultant calcined pigment to effect substantially complete removal of potassium sulfate therefrom and thereupon recalcining said pigment to convert the same to substantial rutile modification. No. 2,273,431. James E. Booge to E. I. du Pont de Nemours & Co.

Method producing copper pigments comprising thermally decomposing one or more copper compounds selected from group consisting of copper linoleate, stearate, oleate, resinate and naphthenate in presence of sufficient alkali to appreciably lower the decomposition temperature. No. 2,273,597. Arthur Schroder to The Pure Oil Co.

Petroleum

Lubricant comprising a hydrocarbon oil of lubricating viscosity and small amount of furfurin, a small amount of an agent from the group consisting of phosphorus and phosphorus sulfides and small amount of a soluble ethanolamine. No. 2,272,205. Everett C. Hughes to The Standard Oil Co.

Process for thermal treatment of hydrocarbons. No. 2,272,209. William O. Keeling.

Process producing polycyclic hydrocarbons from n-butyl benzenes which comprises subjecting a n-butyl benzene to dehydrogenating and cyclizing conditions of temperature and time in the presence of a catalyst comprising a relatively inert support having deposited thereon a compound of a heavy metal selected from the elements appearing in the left-hand column of the fifth group of the periodic table. No. 2,272,266. Aristid V. Grosse and William J. Mattox to Universal Oil Products Co.

Process producing high yields of good quality Diesel fuel and good antiknock gasoline from hydrocarbon oil of relatively wide boiling range. No. 2,272,285. Charles H. Angell to Universal Oil Products Co.

Process of cracking hydrocarbon oils. No. 2,272,297. Clarence G. Gerhold to Universal Oil Products Co.

Preparation of catalytic masses. No. 2,272,301. Ivar H. Kinneberg & Jacob Elston to Universal Oil Products Co.

Process of selectively refining petroleum oils. No. 2,272,372. Arthur W. Hixson and Ralph Miller to The Chemical Foundation, Inc.

Lubricating oil, a small quantity of a chlorine containing carbon compound and from .001 of 1% by weight of a hydrogenated derivative of naphthalene. No. 2,272,470. Bert H. Lincoln and Waldo L. Steiner to Continental Oil Co.

Method removing undesirable sulfur compounds from petroleum distillate. No. 2,272,594. Richard O. Bender to Sinclair Refining Co.

Method removing undesirable sulfur compounds from light petroleum distillate. No. 2,272,595. Richard O. Bender to Sinclair Refining Co.

Method removing undesirable sulfur compounds from light petroleum distillate. No. 2,272,596. Richard O. Bender to Sinclair Refining Co.

Method for Geochemical Prospecting. No. 2,272,645. Esme E. Rosaire.

In water flooding process wherein water is injected into porous strata of various permeabilities surrounding an input well and water and oil are removed from production well, the process which comprises injecting into said input well in solution at least one substance which reacts with at least one component of porous strata to form a plugging precipitate partially obstructing pores thereof in portions of strata adjacent the input well, and resuming injecting of water into the input well. No. 2,272,672. Harvey T. Kennedy to Gulf Research & Development Co.

Gas repressuring of oil fields. No. 2,272,673. Harvey T. Kennedy to Gulf Research & Development Co.

Lubricant. No. 2,272,923. Carl Prutton to The Lubri-Zol Development Corp.

Method removing impurities from hydrocarbon oil which comprises treating the oil under refining conditions with hydrochloric acid and a calcined mixture of a silica hydrogel and a heavy metal hydrogel. No. 2,273,012. Wayne Benedict and Jacob Ahlberg to Universal Oil Prods. Co.

An alkylation process which comprises reacting isobutene with isobutane in the presence of aluminum chloride and hydrogen chloride at an alkylating temperature above 0° C. and under sufficient pressure to maintain a substantial portion of the hydrocarbons in the liquid phase. No. 2,273,041. Vladimir Ipatieff and Herman Pines to Universal Oil Products Co.

An alkylation process which comprises reacting normal butene with isobutane in the presence of aluminum chloride and hydrogen chloride at an alkylating temperature above 0° C. and under sufficient pressure to maintain a substantial portion of the hydrocarbons in liquid phase. No. 2,273,042. Vladimir Ipatieff and Herman Pines to Universal Oil Prods. Co.

An alkylation process which comprises reacting propene with isobutane in the presence of aluminum chloride and hydrogen chloride at an alkylating temperature above 0° C. and under sufficient pressure to maintain a substantial portion of the isobutane in liquid phase. No. 2,273,043. Vladimir Ipatieff and Herman Pines to Universal Oil Prods. Co.

Stabilization of oils. No. 2,273,062. Sidney Musher to Musher Foundation, Inc.

Powdered catalyst system. No. 2,273,075. George Weems, 3rd to Standard Oil Co., Chicago, Ill.

Powdered catalyst regeneration and recovery. No. 2,273,076. Vanderveer Voorhees to Standard Oil Co., Chicago, Ill.

Catalytic hydrocarbon conversion system. No. 2,273,089. Morris Carpenter to Standard Oil Co., Chicago, Ill.

Process for removal of mercaptan compounds from oils boiling above about 250° F. No. 2,273,104. William Heilman to Standard Oil Development Co. a corp. of Del.

Process of decolorizing petroleum oils in a distillation tower comprising withdrawing constituents of the oil from a point below the feed inlet to the tower, forming a clay slurry with the fraction withdrawn, then reintroducing said slurry into said distillation tower at a point below the point at which said constituents were withdrawn. No. 2,273,147. Frederick Schumacher and Robert Ferguson to Standard Oil Development Co. a corp. of Del.

Process of de-oiling slack wax containing more than about 8% of oil, comprising puddling and filtering said wax followed by washing with a dewaxing solvent and then compressing the wax cake at a pressure of from about 10 lbs. to 40 lbs. per square inch at a temperature in the range from 30° F. to 60° F. No. 2,273,153. Reginald Stratford to Standard Oil Development Co. a corp.

(Additional Patents on Petroleum, Resins, Plastics, Rubber and Textiles for the above volumes will be given next month.)

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published June 24, 1941

Submerged combustion burner adapted for the production of anhydrous sodium sulfate. No. 397,479. Ozark Chemical Company. (Henry W. Doennecke, Emory W. Douglass and Carl O. Anderson).

Luminescent material consisting of manganese activated zinc zirconium silicate or germanate. No. 397,497. Radio Corporation of America. (Humboldt W. Leverenz).

Leather finishing process comprising drumming tanned hides with a concentrated alkaline solution of recovered lignin from woody fibers, the alkalinity and concentration of said solution being so adjusted that the normal acidity of the tanned hide precipitates the lignin in insoluble form **in situ** in the hide. No. 397,500. Robesson Process Company. (Frederick J. Wallace).

Ore concentration by the sink and float method using a heavy separating medium having a density of at least 2.5 which is substantially stable when in a quiescent condition, in the absence of a deflocculating agent. No. 397,504. Sink and Float Corporation. (Andrew Pearson).

Wiping solder containing an amount of tin between about 30 and 40% by weight, an amount of arsenic between about 0.08 and 0.12% by weight, and the remainder lead together with incidental impurities. No. 397,521. Western Electric Company. (George S. Phipps and Earle E. Schumacher).

Fish-net preservative, consisting of a water soluble anti-fouling agent, a binder, and a solvent for the anti-fouling agent and pentachlorophenol. No. 397,524. John Starr Brooks. (Stanley H. Chambers).

Road tar having incorporated therein a quantity below 1% of an unchlorinated polyvinylchloride. No. 397,535. I. G. Farbenindustrie A. G. (Alfred Sirot and Georg Wick).

Road tar improving method comprising heating the tar to a temperature between 100 and 120° C. and adding thereto a few tenths of one per cent. of a polymerized vinyl compound. No. 397,536. I. G. Farbenindustrie A. G. (Alfred Sirot).

Aluminum alloy improved with respect to its working with cutting tools. No. 397,537. I. G. Farbenindustrie A. G. (Adolf Beck and Hans Bohner).

Aluminum alloy improved with respect to its working with cutting tools. No. 397,538. I. G. Farbenindustrie A. G. (Adolf Beck and Hans Bohner).

Cellulose substance disintegrating process by treatment of substances containing cellulose with hydrochloric acid and an organic solvent. No. 397,539. Firm of J. W. Darboven. (Casar Darboven).

Granted and Published July 1, 1941.

Ore concentration process comprising agitating under gas-introducing conditions an aqueous suspension of suitably divided particles of an ore containing a recoverable portion of at least one metalliferous mineral of a metallic, resinous or adamantine luster, hereinafter referred to as class A mineral, and at least one non-silicon-bearing mineral of a vitreous or earth luster, hereinafter referred to as a class B mineral, in the presence of normal amounts of a collector consisting of a water-soluble soap and a depressing agent for class A mineral consisting of at least one inorganic alkaline substance, and subsequently separating a class B mineral enriched material adhering to gas from a class A mineral enriched material adhering to water. No. 397,558. Antoine M. Gaudin.

Eye lotion tablet and method for its production. No. 397,570. George Wright Taylor.

Oil-resistant coating composition produced by method comprising milling cured alkyd resin on mixing rolls until a strong sheet is formed, milling plastic polymers of chloroprene until broken down, adding the milled alkyd resin sheet to the milled plastic polymers of chloroprene, subjecting the mass to further milling, and heat curing the composition. No. 397,585. Canadian General Electric Company Limited. (Moyer M. Safford).

Mange remedy comprising an aqueous emulsion the dispersed phase of which contains tetraethyl thiuram monosulfide dissolved in a vegetable oil in proportions of substantially 1:1 and the emulsifying agent of which is solubilized casein in an amount sufficient to produce stable emulsion, said emulsion containing as a wetting agent a salt of a sulfate of a higher aliphatic alcohol containing more than seven carbon atoms and water so proportioned that when the emulsion is applied to a hairy portion of an animal it freely penetrates to the skin without depositing excessive and undesirable amounts of oil on the hair. No. 397,591. Canadian Industries Limited. (Wendell H. Tisdale and Albert L. Flenner).

Ignition composition comprising calcium hypophosphite and an oxidizing agent. No. 397,592. Canadian Industries Limited. (Lawton A. Burrows).

Making 2-chloro-1, 3-butadiene by reacting monovinylacetylene with hydrogen chloride. No. 397,593. Canadian Industries Limited. (Albert S. Carter).

Molding powder made by incorporating in an uncured resin of the urea-formaldehyde type when in powder form a tri-ester of phosphoric acid. No. 397,594. Canadian Industries Limited. (James M. Walter).

Molding powder prepared by incorporating trimethyl phosphate in an uncured resin of the urea-formaldehyde type when in the powder form. No. 397,595. Canadian Industries Limited. (James M. Walter).

Laminating fiberboard by assembling a plurality of paper elements on an assembling machine and holding the elements in assembled relation by means of a silicate adhesive applied only between the elements. No. 397,596. Canadian Industries Limited. (Paul C. Lemmerman).

Alkali metal manufacture by electrolysis of a solution including alkaline earth metal halide and alkali metal halide with a mercury electrode. No. 397,597. Canadian Industries Limited. (Harvey N. Gilbert).

Ethylene polymer thread, ribbon, film and tube manufacturing by introducing a stream of a normally solid ethylene polymer into a precipitating liquid which is miscible with the solvent in which the polymer is dissolved and which is a non-solvent for the polymer, the polymer solution and the precipitating bath being at a temperature of at least 70° C. No. 397,598. Canadian Industries Limited. (James R. Myles and Leslie L. Bache).

Ore floatation process for concentrating ores containing siliceous gangue which comprises adding to the pulp a cation active flotation agent and a small amount of a water-soluble inorganic salt of a polybasic inorganic acid and subjecting the mixture to a flotation operation. No. 397,599. Canadian Industries Limited. (James E. Kirby and Joseph L. Gillson).

Lubricated spinneret for use in apparatus capable of spinning a molten organic filament-forming composition substantially without flicking. No. 397,600. Canadian Industries Limited. (William H. Bradshaw).

Acyl-oxy acetic acid production by reacting formaldehyde, an organic acid and carbon monoxide in the substantial absence of water, substantially in accord with the following equation: $n(HCHO) + n(CO) + HnX \rightarrow X(CH_2COOH)n$ in which X is the anion of an organic acid and n is an integer. No. 397,601. Canadian Industries Limited. (Donald J. Loder and Edward P. Bartlett).

Paper coloring process involving the use of a soluble sulfide and a reduced sulfur dyestuff containing the sulfide. No. 397,602. Canadian Industries Ltd. (Edwin R. Laughlin).

Nitrostarch explosive comprising particles of nitrostarch dispersed within crystals of ammonium nitrate, having an enhanced sensitivity to propagation and decreased sensitiveness to unintentional initiation as the result of crystallization from substantially anhydrous liquid ammonia. No. 397,604. Canadian Industries Ltd. (Clyde O. Davis).

Perchlorate explosive comprising a solid dispersion of an oxygen-accepting ingredient in an inorganic salt of an acid taken from the group consisting of chloric and perchloric acids, which salt is soluble in anhydrous liquid ammonia and stable under atmospheric conditions, said dispersion resulting from crystallization from substantially anhydrous liquid ammonia. No. 397,605. Canadian Industries Limited. (Clyde O. Davis).

Vinyl acetate stabilization by adding thereto in inhibitor amounts substance selected from the group consisting of rosin and the copper, zinc, magnesium, aluminum and cobalt resinate. No. 397,606. Canadian Industries Limited. (Gelu S. Stamatoff).

Glycolic acid ester preparation by reacting formaldehyde and an aliphatic monohydric alcohol with carbon monoxide. No. 397,607. Canadian Industries Ltd. (Donald J. Loder).

Nitrile manufacture by passing, at a temperature of between 400 and 550° C. a mixture of ammonia, in molecular excess, and a carboxylic compound, adapted to form an ammoniated carboxylic compound, over a compound of boron and phosphorus as a catalyst. No. 397,608. Canadian Industries Limited. (Herrick R. Arnold and Wilbur A. Lazier).

Electrolytic cell gas outlet for discharging the products of electrolysis. No. 397,609. Canadian Industries Ltd. (Ernest R. Corneil).

Gelatinized high explosive comprising a liquid explosive nitric ester gelatinized with nitrocellulose and an aliphatic alcohol having the formula R-CO-R_1 in which R is an alkyl radical or hydrogen and

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R_1 is an alkyl radical having one hydrogen group replaced by a hydroxyl group. No. 397,610. Canadian Industries Ltd. (Hartwell H. Fassnacht).

Insecticide and fungicide composition containing a cupric chelate compound. No. 397,611. Canadian Industries Ltd. (Albert L. Flenner, Robert B. Flint, Frank H. Kaufert and Louis Spiegler).

Cellulose film comprising 100 parts by weight of cellulose acetate propionate and from 50 to 150 parts of a tributyric acid ester of glycerol. No. 397,612. Canadian Industries Limited. (Robert E. Fothergill).

Silver recovery from photographic waste liquids. No. 397,613. Canadian Ltd. (John H. Folwell).

Photographic film, flexible and free from brittleness, comprising a cellulose organic derivative support and an emulsion layer, and between said support and said emulsion layer, a subbing layer of resinous ester of the lactone of a heteropolymer of a vinyl compound and an unsaturated alpha-beta-dicarboxylic acid. No. 397,614. Canadian Kodak Company Ltd. (James G. McNally and Russell H. Van Dyke).

Manganese electro-deposition process comprising introducing an electrolyte into an electrolytic cell, the electrolyte comprising an aqueous solution of hydroxy amine and manganese salts, the manganese salts being selected from the group consisting of sulfates and chlorides, the solution containing at least 5 gram per liter of manganese, the concentration ratio of hydroxy amine to manganese being greater than about 3 to 1, and electrolyzing with a minimum cathode current density of about twenty amperes per square foot. No. 397,619. The Consolidated Mining and Smelting Company of Canada Limited. (Reginald S. Dean).

Oil purifying device comprising a thick mass of fibrous absorbent material pierced at its base by a hollow conical depression and internally supported by a metallic helix, the convolutions of the helix being roughly parallel to the conical member throughout its extent. No. 397,621. De Luxe Products Corporation. (James E. Hurn).

Chlorination process for substituting chlorine for hydrogen in methane without formation of free carbon comprising passing a mixture including gaseous methane and chlorine through an elongated channel between two closely adjacent graphite surfaces substantially free of metals and maintaining one of said surfaces at a temperature of about 360° C. No. 397,625. The Dow Chemical Company. (Harry Bender).

Chlorinating methane by subjecting a methane-chlorine mixture to electromagnetic radiations containing a preponderant quantity of rays of wavelength 3000-4000 A, while confining said mixture at least initially between walls not over 5 mm. apart at about atmospheric pressure. No. 397,626. The Dow Chemical Company. (Harry Bender).

Chlorination process comprising reacting gaseous chlorine and a hydrocarbon mixture containing at least two different hydrocarbons, each having less than seven carbon atoms under the influence of light effectively promoting the reaction while bubbling said chlorine and said mixture up through an irradiated liquid body of liquified products of said reaction. No. 397,627. The Dow Chemical Company. (Harry Bender).

Plastic polymer of chloro-2-butadiene-1, 3 formed by polymerization while emulsified in water, which emulsion is acid during the entire period of polymerization, said plastic polymer being further characterized in that it is capable of being readily cured to a highly elastic product and has, in chemical combination, a small amount of a mercapto carboxylic acid. No. 397,228. E. I. du Pont de Nemours & Co. (Howard W. Starkweather and Arnold M. Collins).

Chloro-2-butadiene-1, 3 plastic polymer formed by polymerization while emulsified in water, which emulsion is acid during the entire period of polymerization, said plastic polymer being further characterized in that it is capable of being readily cured to a highly elastic product and has, in chemical combination, a small amount of an unpolymerizable acid-stable organic compound containing the nucleus —C=C—C=O. No. 397,629. E. I. du Pont de Nemours & Company. (Howard W. Starkweather and Arnold M. Collins).

Chloro-2-butadiene-1, 3 plastic polymer formed by polymerization while emulsified in water, which emulsion is acid during the entire period of polymerization, said plastic polymer being further characterized in that it is capable of being readily cured to a highly elastic product and has, in chemical combination, a small amount of an aromatic sulfinic acid. No. 397,630. E. I. du Pont de Nemours & Company. (Howard W. Starkweather and Arnold M. Collins).

Fibre-forming synthetic linear polyamide in the form of sheet material having crystal aggregates whose average diameter is less than two microns. No. 397,631. E. I. du Pont de Nemours & Company. (George DeWitt Graves).

Chromium alloy containing 5-30% chromium, an effective amount to 3% carbon, 0.05-0.5% nitrogen, 0.05-0.5% titanium and the remainder iron. No. 397,632. Electro Metallurgical Company. (Emanuel Valenta).

Deoxidizing molten iron or steel by adding to the molten iron or steel a grain-refining amount less than 1% of an addition agent containing 35% to 55% silicon, 5% to 15% aluminum, 5% to 15% zirconium, 5% to 15% vanadium, the remainder iron. No. 397,633. Electro Metallurgical Company of Canada Limited. (James H. Critchett and Walter Crafts).

Treating molten metal of ferrous type by adding thereto a grain-refining amount less than 1% of an addition agent containing 35-55% silicon, 3-20% of each of at least three elements selected from the group titanium, zirconium, cerium, hafnium, and thorium, the sum of the elements of said group being at least 10% and not more than 35%, and the remainder iron. No. 397,634. Electro Metallurgical Company of Canada Limited. (James H. Critchett and Walter Crafts).

Metal addition agent for treating molten ferrous metal, containing 35-55% silicon, 3-20% of at least two elements selected from the group vanadium, columbium, and tantalum, and the remainder iron. No. 397,635. Electro Metallurgical Company of Canada Limited. (James H. Critchett and Walter Crafts).

Formaldehyde sulfoxylate of alkali metal manufactured by forming a slurry of crude alkali metal formaldehyde sulfoxylate crystals, liquefying the crystals, and separating the solid material from the resulting liquid. No. 397,645. General Chemical Company. (Lee B. Smith).

Welding rod comprising a binder and ingredients at least a substantial part of which are comminuted and unalloyed with the remainder of said ingredients, said ingredients being so chosen and proportioned that the rod when used for fusion-deposition welding produces a deposit having as essential ingredients 12-75% of at least one metal of the group consisting of chromium, tungsten, molybdenum, columbium and tantalum, and the remainder principally metal selected from the group consisting of cobalt, nickel, and iron, together with carbon in an amount not exceeding 4%, the iron content not exceeding 25%. No. 397,647. Hayes Stellite Company. (William A. Wissler).

Intaglio ink comprising a solution of 15-30% gilsonite in liquid component containing 85-95% petroleum naphtha more volatile than benzol and 5-15% of a ketone more volatile than benzol. No. 397,656. Interchemical Corporation. (Walter W. Mock).

Ferro-alloy casting substantially free from surface and included foreign matter impurities, solid throughout its mass, and stable against disintegration, resulting from solidification of ferro-silicon from the liquid state by pouring in a stream upon the surface of a heat-conducting mold while effecting relative movement between the stream and the mold and rapidly solidifying the ferro-silicon by abstracting heat from it throughout the mold. No. 397,673. Ohio Ferro-Alloy Corporation. (Huck V. Glunz and Ernest C. Painter).

Separating glyceride oils of a class consisting of linseed, soya bean, fish and cottonseed oil from materials containing them which comprises extracting the material with a furan compound selected from the group consisting of furfural and furfuryl alcohol at a temperature not substantially below 104° F. to obtain a solution of oil in the compound, then cooling the solution to effect separation of highly saturated glycerides as a liquid phase separating the two liquid phases and removing the furan compound therefrom. No. 397,680. Pittsburgh Plate Glass Company. (Stephen E. Freeman).

Treatment of oils to improve the drying characteristics thereof which comprises extracting the oils with furfural at a temperature sufficient to dissolve a substantial part of the glycerides, then adding water to the solution and removing the furfural from the separated oil. No. 397,681. Pittsburgh Plate Glass Company. (Stephen E. Freeman).

Priming compositions for ammunition comprising an admixture of lead nitrohypophosphite with inexplosive ingredients selected from the groups of known oxidizers, fuels and abrasives. No. 397,686. Remington Arms Company, Incorporated. (Willi Brun and James E. Burns).

Naphthenic acid recovery from hydrocarbon oils by contacting the oil with lithium chloride in the vaporphase. No. 397,690. Shell Development Company. (Franz R. Moser).

Petroleum suspension breaking process for liberating petroleum oil from relatively stable petroleum mixture containing it and oil-insoluble matter comprising an alkaline earth metal salt, which mixture by the addition of orthophosphates forms secondary mixtures incapable of resolution. No. 397,691. Shell Development Company. (Samuel K. Talley and Carols L. Gutzeit).

Insecticide and fumigant composition containing as a toxic principle an alkene halogen thiol containing from 2 to 6 carbon atoms. No. 397,692. Shell Development Company. (William Coltof).

Naphthenic acid recovery from hydrocarbon oils by contacting the oil in the vapor phase with a catalyst mass containing at least one alkali metal compound together with at least one alkaline earth compound. No. 397,693. Shell Development Company. (Franz R. Moser).

Acetylenic carbinol manufacturing process comprising pyrolizing an acetylenic glycol, and separately recovering the acetylenic carbinol thus produced. No. 397,698. Union Carbide and Carbon Research Laboratories, Inc. (Thomas H. Vaughn).

Hard microporous plastic material prepared by incorporating throughout a mass of the dry plastic a granular friable highly hydrous inorganic oxide gel having the capacity to lose water and shrink on drying, shaping the mass as desired, and subsequently curing the mass under non-evaporating condition, whereby to provide a high degree of microporosity. No. 397,702. United States Rubber Company. (Joseph A. Baty and Albert W. Meyer).

Hard microporous plastic material prepared by incorporating throughout a mass of rubber or the like heat-hardenable plastic material a granular soft friable hydrous silicic acid gel. No. 397,703. United States Rubber Company. (Joseph A. Baty and Albert W. Meyer).

Waste paper cardboard manufacture by forming a wet web of paper-making material containing large quantity of waste paper, impressing closely-spaced and substantially-opposing transver grooves in opposite surfaces of the web while still in wet condition to thereby form in the central part of the web interspaced strip-shaped portions of compacted dense structure, and drying the grooved web. No. 397,710. Papier Product Octrooien (Paper Products Patents) N. V. (Albert Benda).

Straw bleaching process for producing bleachable half stuffs and pulps from straw, consisting in boiling the straw with milk of lime, running off the lime liquor, and then mechanically disintegrating the boiled straw material into fibres whilst simultaneously washing with water as long as constituents are washed away in appreciable quantity from the straw material. No. 397,712. Kurt Hess and Max Ulmann.